PERSPECTIVES OF STATE AND LOCAL GOVERNMENTS ON FEDERAL INFORMATION DISSEMINATION

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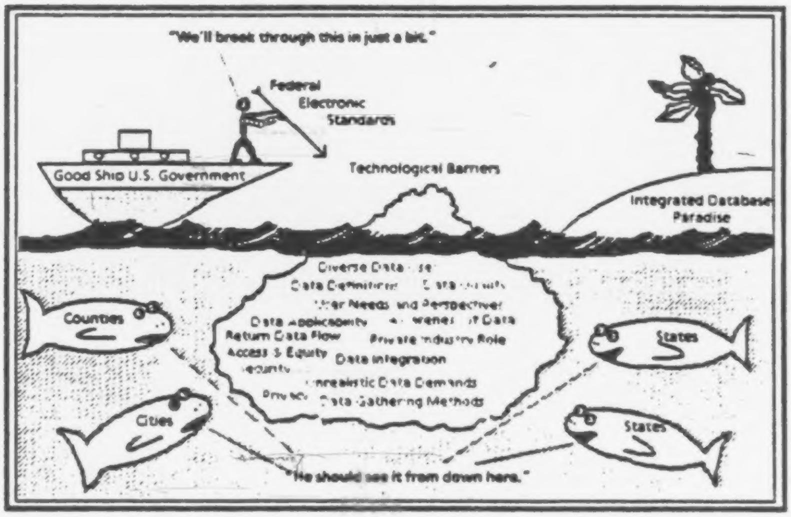

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Contents

List of Appendices iv

Acknowledgments v

Summary vi

Introduction 1

Research Methodology 3

I. State and Local Criteria for Evaluating Federal Information Alternatives 5

- IA Improvements to federal information dissemination cannot be achieved without considering the problems associated with federal information gathering 6
- IB State administrators are less concerned with possible increases in their information costs than they are with possible reductions in their information labor 8
- IC Compatibility and standards should be evolved from user needs, not imposed by federal decree 9
- ID Federal information policy must accommodate the great diversity at state and local levels 11
- IE State and local governments deserve special consideration commensurate with the special roles they play in federal information dissemination 12
- IF State and local officials prefer small, well defined changes based on specific needs to major federal modifications with far-reaching implications 14
- IG State planners need federal information that is more easily found, more easily accessed, more carefully documented, more timely, and more suitably packaged for their particular state 15

II. State and Local Practices as Possible Models for Federal Information Alternatives 18

- IIA Governmental Budgetary Information Systems-- The New Hampshire Integrated Financial System 19
- IIB Centralized Government Information Agencies-- Washington's Department of Information Services, Minnesota's Information Policy Office, New Jersey's Office of Telecommunications and Information Systems, and New York's Forum for Information Resource Management 20
- IIC State Efforts to Accommodate Diverse User Needs-- Minnesota's Intergovernmental Information Systems Advisory Council and Washington's Office of Information Services 22
- IID Online Data Services-- Minnesota's DATANET, the National Governor's Association's State-TIES, the Council of State Policy and Planning Agencies' State Scanning Network, and the Council of State Governments' ISIS 24

III. State and Local Concerns Over Policy Issues Related to Federal Information Alternatives 27

- IIIA Privacy and Security 28
- IIIB Ownership and Cost 29
- IIIC Privatization of Information 30
- IIID Equity of Access 31
- IIIE Responsibility 32
- IIIF Open Government 33
- IIIG Technology and Government Operations 34

Conclusion 35

Reference Notes 36

List of Appendices

I. Initial Contact List for OTA Study 39

II. In-depth Interviews List 44
    II A. Phone Interview
    II B. Personal Interview

III. Interview Questions 49
    III A. Initial Telephone Interview
    III B. In-depth Interview

IV. Selected Literature 53

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Summary

State and local governments are special partners in the process which culminates in the federal dissemination of information. Not only do state and local governments receive, redistribute, and use federal information, but, of equal importance, they are involved in the other end of the process--the gathering and transmitting of information for federal agencies. And this is not all. State and local governments integrate, manipulate, and even regulate federal information within their own spheres of influence. Information dissemination cannot be treated separately from these other aspects of information systems, particularly information gathering. It is therefore impossible to improve and coordinate federal dissemination of information without understanding and accomodating the roles and needs of state and local governments.

This is not an easy task. State and local officials are a complex and diverse group working in equally complex and diverse situations. From the perspective of federal information systems personnel, it seems cheaper and more sensible for state and local officials to adapt to federal systems, rather than for the systems to adapt to the myriad of state and local officials. Unfortunately, information systems established primarily from the perspective of the systems' operators, rather than from the perspectives of the users, serve the system first and people second. It is far simpler to create an information system that is internally functional than it is to create one that is functionally useful.

Generally, current federal systems for disseminating information and data are not adequately serving state and local governments. Most state and local officials feel they expend far too much effort generating and transmitting information to the Federal Government and get far too little that is useful in return. Federal data gathering appears driven by federal information systems' requirements rather than people's needs. Data passed on to the Federal Government is often not returned, and when it is, it is often in a form that is useless for state and local needs. Unclear federal data classifications and demands for excessive levels of detail force state and local officials to report meaningless information to federal agencies, which is then incorporated into federal data and analyses. Insufficient time to gear up for federal information gathering efforts force state and local agencies to massage similar, previously gathered data and resubmit it. Duplication of data gathering for various federal agencies appears to be the rule rather than the exception. The states see too much of the information gathered by federal agencies as being of the "nice to know" variety, rather than the "need to use" category. What is perhaps most frustrating to state and local officials is that federal agencies seem not to care when they are sent meaningless and redundant data and information.

In some cases, coordination of federal information policy and shared standards would help. Presently, each federal agency wants its own flavor of information for its own purposes and in its own format. The resulting overlap of effort at state and local levels is considerable. However, far and away the greatest amount of wasted effort is attributable not to lack of standards, but to the failure of federal information systems to accommodate the diverse situations and needs of users.

In response to recent initiatives to modify federal information dissemination, state and local officials prefer small, well defined changes based on their specific needs to major federal modifications with far-reaching implications. If a coordinated effort is required, it is in the area of integrating agency missions, information systems, and the complex and diverse needs of users. If federal and state information perspectives are not reconciled, state and local officials will continue to expend excessive labor and resources generating data that is too often useless or meaningless, while federal agencies continue to expend considerable effort on isolated systems that primarily feed themselves.

In addition to these difficulties related to agency coordination and system development/use, there are numerous broad policy issues that also must be addressed. Electronic information introduces new and thorny legal, social, economic and moral dilemmas related to privacy, security, equity, responsibility, ownership, cost, open government, privatization, and government practice. Even more than the systems themselves, questions in these areas will require slowly developed definitions and tentative solutions before more definitive answers can be developed.

Taken as a whole, the federal system for gathering and disseminating information is an ad hoc conglomerate of efforts developed over time and usually in isolation from each other. A major organizational overhaul of federal information agencies might create as many problems as it solved. Neither should reorganization be based merely on new communication technology; instead, immediate steps must be taken to focus the federal information dissemination system on the individuals and institutions (such as those in state and local government) that use it to advance our nation's economic, social, and democratic well-being. To do this, we must first understand the diverse needs and perspectives of federal information users, and then coordinate and integrate federal information policy and practice with an eye towards meeting those needs.

Perspectives of State and Local Governments on Federal Information Dissemination

Introduction

At a mid-July hearing before the House Subcommittee on Science, Research, and Technology, Alvin W. Trivelpiece, executive officer of the American Association for the Advancement of Science, had a curt reaction to new initiatives to reorganize the federal collection and dissemination of scientific and technical information. At issue were two bills. HR 2159, introduced by Rep. Doug Walgren (D) of Pennsylvania, would change the National Technical Information Service into a wholly owned government corporation under the Secretary of Commerce. HR 1615, a far more comprehensive measure introduced by Rep. George E. Brown (D) of California, would create a centralized government information agency to include not only N.T.I.S., but other federal offices which are involved in the sale or distribution of federal information to the public, such as the Government Printing Office. Trivelpiece's response was brief, "It boils down to a version of this ancient saying: If it ain't broke, don't fix it." [1]

But research scientists are not the only ones who would be affected by measures like that of Rep. Brown which would more strongly coordinate federal information dissemination. Had there been state and local government officials at this hearing, their response would have been quite different from Trivelpiece's. These officials, so crucially involved in the collection, manipulation, dissemination, and regulation of governmental information, are often hampered by the lack of coordination and consistency on the part of federal agencies. And while they might not have supported either of these bills, their reason would have been, "It's broke so bad, this won't fix it."

From the perspective of state and local government, the issues raised by federal efforts to coordinate information dissemination are extremely diverse and complicated. Many of these issues are directly related to the impact of new technology, while others exist even in the world of traditional government printing and microfiche storage. During our investigation, this diversity of issues translated into a tremendous variety of responses and stances by state and local officials. But more importantly, as our investigation progressed a center of gravity emerged where the various themes overlapped. The first goal of this report is to describe and analyze the major components of this overlap as expressed by state and local officials in response to both present methods of federal information dissemination and potential alternatives.

During the course of our investigation, a second goal became apparent. Much that occurs at the state level is a microcosm of federal activity. Problems with federal information transfer expressed by state officials were mirrored by local officials in relation to state information efforts. The federal initiative to manage and coordinate information systems is echoed in efforts by almost every state in the union to do the same thing. The second goal of this report is to describe what is and isn't working in the states' efforts to adjust to the new information technology. Whether successful efforts can serve as models will depend, of course, on the extent to which the Federal system is similar to the state operation under study.

Finally, certain public policy issues relating to the applications of new information technology deserve separate attention. The role of the private sector, concerns for privacy and security of information, the impact on institutional structure and government operation, equity of access by different parties, open government, who has responsibility for information--the perspective of state and local government on these issues is relevant and important enough to treat separately. Since OTA will be analyzing these policy areas as part of its larger project, our third and final goal is to describe and analyze state concerns and recommendations on these topics.

This report, then, has three parts:

(1) State and Local Criteria for Evaluating Federal Information Alternatives

(2) State and Local Practices as Possible Models for Federal Information Alternatives

(3) State and Local Concerns Over Policy Issues Related to Federal Information Alternatives

Taken as a whole, these sections argue not only for certain choices and policies within the spectrum of federal alternatives, but also for the necessity of carefully considering the state and local perspective in any decisions concerning information dissemination to be made by the federal government.

Research Methodology

Our project at the University of Washington is part of a "problem-oriented assessment" which has the overall purpose of investigating the changing nature of Federal information dissemination in light of new technological developments and evolving policy goals. The methodologies employed for our research were adopted in light of the research objectives set forth by OTA: to understand the opportunities and problems presented by new electronic technologies; to picture current and planned Federal agency use of traditional and new technologies for information dissemination; to understand the needs of the users of Federal information; and to analyze relevant institutional and policy options. Our project had a specific focus on activities and perspectives of state and local governments and attempted to explore both how such entities might be impacted by changes in Federal information handling as well as whether they were currently engaged in any activities which could serve as possible models for the Federal level.

The major "bounding" conditions on our project were the allocated budget and personnel time. [2] Within these constraints, we have been able to describe the current technological uses of interest, the key actors, the major policy issues, impact areas, and value orientations. We have been able to uncover a number of possible subjects for case studies. However, we were not able to investigate most of these in great depth for the current project, which was a broad-view "mini assessment" in Arnstein's typology. [3] The main techniques which we employed included structured group brainstorming relying on our own expertise, review of the literature, discussions and consultations with knowledgeable relevant experts, and a two-tier interview process (predominantly conducted over the telephone) to elicit information and opinions from state and local personnel currently using innovative communication technologies and likely to be impacted by Federal information policy.

The literature survey turned out to be somewhat unusual in this project. Although we had access to a major research university library system, almost nothing specifically pertinent to this project could be uncovered. Conversely, we were in danger of being overwhelmed by the large number of items which had some seeming relevance but were exceptionally general or not sufficiently on point. The most productive and informative written materials which we uncovered and used were reports and documents from the OTA and other knowledgeable experts, sometimes amounting almost to memos and other sorts of "fugitive literature." We obtained examples of this sort of "literature" during our visits to New York, New Hampshire, Minnesota, and Washington. A summary of our literature search is in Appendix IV.

Our main initial contact with knowledgeable persons occurred through the participation of the principal investigator at "Piecing the Puzzle Together: A Conference on Integrating Data for Decisionmaking" held in Washington, D.C. May 22-29, 1987 by, among others, the National Governors Association (Center for Policy Research), CODATA, and IDUW (Integrated Data Users Workshop). Professional networks, literature, and personal/professional knowledge also supplied names of additional possible interviewees. We then selected approximately 50 people from local, state and Federal government, and from private industry for our first-round interviewing (see Appendix I). The purpose of this initial round was to determine innovative uses of electronic technology and to define the scope of policy issues and problems affecting organizations or companies. These interviews were conducted in a period of roughly a month (June 25-July 21st). During our discussions we asked four basic questions: 1) Can you give us a quick overview of your organization's activities? 2) What kind of backing or encouragement has this program received? 3) What are some of the policy issues that have arisen in the course of this technology or program? 4) What other people should we talk to about this situation and why?

Responses were logged on a telephone interview form (see Appendix III.A.). A subjective evaluation was made of each interview on a one-to-five scale (with one as the highest rating) to indicate whether we thought the person might be suitable for the second round, in-depth, interviews. Not unexpectedly, one result of these conversations was to receive the names and telephone numbers of a very large number of individuals who, we were assured in each instance, were doing interesting and important relevant work. This information provides an excellent resource for further detailed research in this problem area by OTA or other interested parties.

The second-round of interviews were conducted both by telephone and in-person. The candidates were selected so that the total pool would reflect the various types of actors (Federal, state, inter-state, local, and private), to include people who were exceptionally knowledgeable in particularly innovative activities, and to provide representative exposure to the variety of policy issues which we had uncovered. Interview trips were made to Minnesota, the State of Washington (capitol area) and New York/New Hampshire. These sites were chosen because of a concentration of potential second-round interviewees. The interviews were made during the first two weeks in August. (Appendix II contains a list of the final interviewees.)

The form used to structure in-depth interviews is in Appendix III.B. The main topics explored in the discussions had to do with state and local government experience as possibly relevant criteria for evaluating alternative information handling arrangements by the Federal government (cost, usefulness, access); state and local government practices as possible models for Federal alternatives (involving acquisition and support of technological systems, and the practices regarding acquisition, support, use, and dissemination of information); and policy issues and problem areas (equity of access, privacy, security of information, the innovation process, the role of the private sector, effects on institutional structure in governmental operation, and responsibility for information).

Much of the information garnered by the researchers is impressionistic and opinionated. This characterization is not meant to cast aspersion on the nature or quality of what we found, only to characterize the essence of much of the research product. Repeatedly our respondents expressed pleasure and encouragement for our activities, being aware that the kind of overview we were attempting is very much needed. In many respects our research was satisfied, and our attempts to uncover, synthesize, and integrate the various strands of opinion and factual information will be useful to Federal information planners. Nonetheless, there was also a frustrating aspect to our project because a much more extensive survey of activities, experience, and attitude in the state, local, and inter-state arenas is possible and needed.

I. State and Local Criteria for Evaluating Federal Information Alternatives

The Federal Government is faced with a wide spectrum of alternatives for its involvement in information dissemination. These alternatives range from the status quo (traditional GPO printing and microfiche storage; individual agencies developing and employing electronic dissemination capabilities on an ad hoc basis) to a comprehensive governmentwide integrated database regulated and maintained by a centralized Government Information Office. In between are a myriad of possibilities based on our rapidly developing information technology and possible policy preferences. The new technologies and procedures include online indexes, online abstracts, electronic depository libraries, electronic printing standards, electronic dissemination standards, online press releases, standardized purchasing, formally shared expertise--each of which can be implemented to varying degrees of effort and completeness.

Because the alternative applications and policies are so numerous and complex, it is difficult to present a unified state or local response to federal information plans. It is possible, however, and far more useful, to present a number of opinions commonly shared by state and local officials on current and proposed methods of federal information dissemination. Thus, rather than focus on specific alternatives, this section will discuss the general positions of state and local government and the impact these positions would have if adopted by federal decisionmakers who will create and modify federal information policy.

The following tenets of the state and local perspective on federal information dissemination are discussed in this section:

A. Improvements to federal information dissemination cannot be achieved without considering the problems associated with federal information gathering.

B. State administrators are less concerned with possible increases in their information costs than they are with possible reductions in their information labor.

C. Compatibility and standards should be derived from user needs, not imposed by federal decree.

D. Federal information policy must accommodate the great diversity at state and local levels.

E. State and local governments deserve special consideration commensurate with the special roles they play in federal information dissemination.

F. State and local officials prefer small, well defined changes based on specific needs to major federal modifications with far-reaching implications.

G. State planners need federal information that is more easily found, more easily accessed, more carefully documented, more timely, and more suitably packaged for their particular state .

I.A. Improvements to federal information dissemination cannot be achieved without considering the problems associated with federal information gathering

The practices which determine the effectiveness and cost of federal information dissemination begin long before the GPO publishes a summary of data or distributes a federal report on microfiche. Because they are involved in so many aspects of the entire information process, state and local officials recognize the impracticality of treating dissemination as distinct from the gathering and manipulation of information. Far too often, state and local agencies feel themselves forced to supply data that they know to be either uninterpretable, inappropriate, or inaccurate. Little wonder that when they see this same data returned as part of U.S. statistical summaries and cited in federal reports, dissemination issues seem of little relevance. Current interest in dissemination standards must be expanded to include coordination of information gathering as well.

One common complaint of state and local officials is that unclear federal data classifications and excessive levels of detail force them to report useless or meaningless information to federal agencies. For example, state departments of transportation are required to report gasoline taxes paid within state geographical areas. In most states this is a reasonable indication of regional gasoline consumption and travel, since gasoline taxes are collected at the pump. In Minnesota, however, thirteen wholesalers pay the entire state tax, so the location of sales tax payment is meaningless as a consumption indicator. States wonder why so much data like this, which is not relevant to them, must be collected and disseminated at great cost by the federal government?

Similarly, state and local agencies involved in human services complain about the excessive detail and unclear definition of federal data gathering requirements. Both in Washington and Minnesota, human services officials point to the reports they must file to justify federal grants. Washington's DSHS complains about unclear and changing definitions, stating that even the experts disagree on their meaning and that federal officials say they will not, or aren't supposed to, specify definitions.[4] Programs have been developed based on one interpretation of terms, but by the time these programs are ready, the definitions and terms have changed. Thus, no matter what the technology for gathering and dissemination, the information used by Federal HHS and other agencies to track and compare these grant supported programs is distorted. Not only can't the collected data be used to judge equity of allocations across states, but it isn't even consistent within each state.

Like Washington's DSHS, Minnesota's DHS claims that the level of detail required by grant reporting forms forces states to provide federal agencies with meaningless numbers in order to receive federal monies. They single out the new "Quarterly Estimates and Expenditures" form, mandated in OMB Circular A-102, as an example of excessive detail requirements for data.[5] One glance at the two-page form with its 929 boxes to be filled in seems to support their claim. This new form has been developed to replace a formerly unstandardized method of gathering data, but DHS cites this as an example of how attempts to standardize can lead to more effort and confusion, rather than less.

Yet another problem cited by both states is insufficient time to gear up for federal information gathering efforts. This forces state and local agencies to rely on similar, previously gathered data. This old data is massaged and fed back to the federal government simply to meet deadlines. This tendency is reinforced by the repeated gathering of the same or similar data by different federal agencies or even units within the same agency.

What is perhaps most frustrating to state and local officials is that federal agencies seem not to care about receiving useless and redundant data and information. Almost every state and local agency we spoke with had a story of passing on horrendous data and never hearing any reaction from the federal agency to which it was transmitted. One agency, to remain nameless, even claimed to have substituted data about the city zoo for data about the city, with no obvious ill effect. Could such a thing be possible?

Yes, and for a number of reasons. Too much of the information gathered by the federal government is of the "nice to know" variety, rather than the "need to use" category. When data is needed to do something, poor data is likely to become apparent; when data is simply nice to have, it is likely to sit in stored form until it is too far removed from the data gathering effort to judge its quality. The new information technology increases the ease with which "nice to know" data can be gathered, the capacity to store and manipulate it, and even the desire to gather it. Data is gathered to meet the needs of systems, rather than the needs of users. Information that is irrelevant to a given state is still required to meet the information format built into the federal system.

All this could be understandable as a burden of federation if the process were rational, but it does not appear so to state and local officials. Information that has already been provided must be provided again because a particular information system cannot accept the data in the form originally provided to another one. Data is required at levels of detail that are meaningful to information software, but meaningless to the state or county. As a result, people in the field pass on a best estimate the accuracy of which nobody can challenge or test.

While the major thrust of this OTA study is on dissemination of information, dissemination cannot be treated separately from the other aspects of information systems. The states see themselves providing the federal government with a constant and costly stream of information that is too often useless and redundant. For this reason, they get little in return. From this perspective, the present initiative to coordinate federal information policy is welcome, provided that the resulting policy decisions not only achieve control and consistency where appropriate, but also allow for flexibility in gathering and dissemination so that appropriate definitions and levels of detail can be adopted for each state's particular information situation.

The message for those evaluating federal information alternatives is that standards for dissemination of online and electronically published material will not achieve the desired effect without a parallel coordination of federal information gathering practices as well. This expansion of concern beyond dissemination certainly makes information policymaking more complicated, but our interviews with state and local officials revealed that it is the only way to do it right.

I.B. State administrators are less concerned with possible increases in their information costs than they are with possible reductions in their information labor

Closely related to problems with definitions and detail of data are the states' concerns over excessive labor spent on information gathering, conversion, and transmission. This is particularly true of administrators charged with labor intensive tasks such as delivering services, maintaining records, and providing welfare and medical benefits. These state and local officials make extensive use of computer information systems to perform their primary tasks, yet they are not able to use these same systems to easily perform their secondary tasks of providing information to the federal agencies which monitor and support their efforts. Federal information demands are so burdensome to state and local administrators that they seem to care little about possible "ripple down" cost effects of federal information policy changes. Instead, they hope for possible decreases in their information effort, even as they worry that federal policy changes may make their information labor even more intensive.

In an ideal world, the filling of federal information requirements by state and local government would simply be a side-effect of the same efforts by which they deliver their services and maintain their records. Instead, these requirements are cited time and again by state administrators as an excessive burden on their already taxed information resources. States maintain their own records, independent of those required by federal agencies. Information is collected and disseminated simply to meet federal requirements, not because the information is of use to the states or counties. In addition, this information is rarely returned to the states in any useful form. Thus, considerable state and local effort is required to feed the demands of federal information systems. Unfortunately, this labor meets few needs of the people these state and local agencies are intended to serve.

Perhaps the best (worst?) example of federal data gathering driven by federal information systems requirements rather than people's needs was related by the Minnesota Department of Transportation.[6] Minnesota DOT sends public safety reports to the Federal Accident Reporting System (FARS), which is run by a unit within the Federal Highway Administration. Then, Minnesota DOT is required to supply the same data for the Highway Pavement Management System (HPMS), run by another unit within the FHA. To do this, Minnesota DOT must retrieve its original data from the FHA, reorganize it, and send it back to the FHA. Why can't the FHA transmit data across the hall from one unit to another?

The FARS and HPMS systems require the data in a different format. Probably it is cheaper and easier for the federal unit to require the states to do the conversion for them than to do it themselves. After all, it costs nothing (from the Federal agency's point of view) to pass on this extra work. The requirement of providing this information is already covered by the fixed Federal subsidy of the state's transportation effort. How often are seemingly duplicate data gathering efforts fueled by federal efforts to "save" money by pushing work down to the states?

In our investigation, it appeared that duplication of data gathering is the rule rather than the exception. Each federal agency wants its own flavor of information for its own purposes, and the resulting overlap of effort is tremendous. No wonder state and local officials feel they spend too much effort generating and transmitting too much data to the federal government with no obvious utility derived from the effort.

One might conclude that standardizing federal information systems would make it easier for information and data to be transmitted across and within federal agencies, thus eliminating the need for conversion by the states. In addition, it might be easier for states to meet their federal information obligations if they could link their information systems to federal ones using a single, standard connection. But even if this standardization of machines and software could be achieved, it still would only be scratching the surface. The data required by federal agencies would still not be based on the needs of state and local users. Unless federal and state information perspectives can be brought in line, states will continue to expend excessive labor maintaining separate and redundant databases, even if those databases reside on compatible machines and software.

I.C. Compatibility and standards should be derived from user needs, not imposed by federal decree

More and more, people use computers to communicate, and when they cannot accomplish a desired communication task, the most obvious reason is often that their machine or software cannot interact easily with some other machine or software package. Thus, many people see the issue of software standards and compatibility as the primary concern to be solved in order to improve federal information systems. Like everyone else, state and local officials are interested in standards and compatibility, but from their unique perspective as gatherers, transmitters, manipulators, users, and regulators of governmental information, they also recognize that technological standards are only the tip of the iceberg.

Most state officials are more concerned with data standards than with system standards. They cite examples such as the numerous ways to define geographical areas and the seemingly countless ways that social service agencies define terms like "case" (Washington's DSHS claimed its 11 units used 13 different definitions). Faced with complexities such as these, state and local data users generally feel that electronic differences don't really matter that much.

This is not to say that machine compatibility is unimportant or that state officials are perfectly content with the current ad hoc proliferation of federal systems and agency standards. Many interview subjects referred to the low level of coordination provided by OMB and pointed out that certain standards and levels of compatibility were necessary to reduce the costs of conversion protocols and to allow for easier adoption of innovative technology. A frustrated official with Washington's DSHS who deals only with FHHS, HUD, and the Department of Agriculture claims he must use a different communication standard for every exchange of information with these agencies.[7] There seems little question that federal standards would impact on state and local efforts to cut costs and achieve compatibility.

For example, the diversity of federal systems is particularly frustrating for states like New York, New Jersey, and Minnesota with central information units attempting to achieve a significant level of intrastate compatibility. Unfortunately, the lack of federal compatibility works against them.

In order to compete for certain federal grants, proposers must promise to provide data and information in a prescribed electronic format. But federal agencies, and even units within agencies, demand that applicants meet different system requirements. How can a state establish and maintain its own machine and software standards when doing so would effectively eliminate that state from consideration for some subset of federal grant opportunities?

Should the federal government impose strict standards for online dissemination and electronic publication? Would this increase the possibility of achieving a desirable level of compatibility throughout the country? On the surface, this appears to be a rational goal. Unfortunately, "rationality" is not the only criterion for public policy and decisionmaking. It was a rational plan for everyone to learn and use Esperanto, an international language constructed around 1880 and declared in 1921 by the British Association for the Advancement of Science to be better for international communication than any dead or modern tongue. However it was impractical to expect people to give up all the cultural and social investments in their native tongues. It would be rational for everyone to use the metric system. However it is impractical to legislate away our society's long standing involvement with feet and pounds. It is similarly impractical to force people, by edict, to ignore complex social, political, and economic commitments to their computer systems. Seemingly simple dissemination standards really reach far beyond dissemination and their implementation quickly becomes anything but simple.

Thus, Washington State's Office of Research and Data Analysis has made three separate attempts to standardize over the past five years. Each time they started out with fairly simple, straightforward goals, and each time they saw their effort explode until it was abandoned over seemingly countless issues. And this office has only 30 people in it. Imagine the problems at the federal level.

But the complex nature of the communication between federal and state groups does not mean we have to abandon all the advantages which arise from common standards. In fact, the highly visible problem of machine compatibility is likely to disappear primarily on its own. Compatibility can be achieved through judicious management, rather than heavy-handed legislation. Functional standards evolved through particular user needs are far more effective than far-reaching technical standards. Thus when someone needs to get specific information from a specific machine, they will develop the necessary compatibility to achieve their goal. In this way a user based compatibility is established quite naturally.

But once a given office has developed this compatibility, another office should not have to repeat efforts that are applicable to them. A federal clearinghouse for shared expertise is essential. Many states, including New York and New Jersey, already have such clearinghouses and are sharing expertise in a number of areas, including format compatibility. This kind of effort, combined with the computer industry's considerable effort to make heterogeneous systems easier to develop and use, will result in a federal information compatibility that allows for previous user commitments and accounts for individual user needs. But the existing diversity of commitments to systems at both the federal and state levels makes an imposed compatibility based purely on technological arguments unworkable.

I.D. Federal information policy must accommodate the great diversity of state and local needs

By now it must be clear that a basic tenet of the state and local perspective is that federal information systems must allow for the diversity of the information users. (Since many of these users and a great deal of this diversity is at the state and local levels, this is not surprising.) However, the people who establish and maintain federal information systems have commitments to those systems. These federal workers tend to view each state's role simply as part of the federal effort. Therefore, they believe these parts should conform to meet the needs of the whole.

States, on the other hand, do not generally view themselves as parts of the federal government in the same way that counties are part of the state. Most state officials believe that federal efforts should be intended to serve them, not the other way around. These officials are unhappy when federal agencies homogenize information to increase the internal efficiency of their systems, but thereby make those systems and information less useful to the states. In one sense, then, many of the complaints at the state level can be seen as a manifestation of the age old struggle between state's rights and federal authority, dressed in new technological garb.

In another sense, however, states are simply pointing out that much of the data they pass on to the federal government is returned in a form that is useless for their needs, if it is returned at all. Perhaps the simplest requirement of a state user is that Federal information be available broken down by state. Yet as obvious as this is, it is often not done.

New Hampshire, for example, exists in a federally defined region with two very large states (New York and Massachusetts) and several small ones (Connecticut, Vermont, Maine, and Rhode Island). In addition to size, these states exhibit wide variations in demographics, urbanization, economic activity, and other factors. Yet Federal data is often only provided for the region, making it useless for New Hampshire. Thus while the 1976 Survey of Income and Education was reported by state and was used effectively by New Hampshire planners, the comparable 1980 survey was reported by region and proved useless to them.

Too often, federal data requirements are defined in such a way as to conflict with state and local needs. The Washington State Employment Security Commission, for example, has received over $1 million from the Bureau of Labor Statistics to produce BLS data on employment and unemployment. But because this data is defined from a national perspective, it is not helpful at the state and local levels. Thus, new funding from the state will be required to make use of this data gathering effort at these levels. Similarly, the city of Milwaukee must recode all geographic census data in order to add its local data, due to differing federal and local information requirements.

When information collection and dissemination are not tied to user need's, not only is data made useless from the diverse perspectives of potential users, but potentially useful data can get lost more easily in the system shuffle. For example, Minnesota's planners have an interest in knowing about job occupations by sex and race to answer questions like "How many black accountants are in Minneapolis?" They know the information is contained in ES202 forms that businesses send to the government, but they don't know anyone who does anything with the information.

They claim that the Bureau of Labor Statistics doesn't even know where the information is. Somehow the BLS information system must be brought more in line with the diverse needs of particular users .

Diverse user needs extend to system as well as data issues. Minnesota demographers claim that federal agencies tend to aim at the lowest common denominator, taking the attitude that "if Mississippi can't do it, nobody can." Of course the issue of equitable access to information is a complex one (and will be discussed further in Section III), but certain states' inability to receive federal bulletin boards at 300 baud should not be sufficient justification for the long time it took to provide b-boards at even this slow speed.

Establishing information systems that allow for the diverse needs and situations of users is not the easy way to go. It happens to be much simpler to set up a system that is internally functional. Unfortunately, information systems established primarily from the perspective of the system's operator, rather than from the perspectives of the users, will serve the system first and the people second.

Difficulties with federal information systems become more understandable when seen in light of similar difficulties experienced by the computer industry as a whole. The computer industry is one of the few industries that has been primarily engineering driven, rather than marketing driven. Of late, some rather spectacular industry failures have resulted from inabilities to "understand the end-user," and industry efforts to incorporate the user's perspective into the design process have greatly increased. Similarly, federal information dissemination practices cannot be justified on the basis of efficacy to the information system, but must rather be justified on the basis of use by an incredibly diverse group of people working on the federal, state, local, private and public levels.

I.E. State and local governments deserve special consideration commensurate with the special roles they play in the process of federal information dissemination.

As we have said, states do not consider themselves to be administrative subunits of the federal government, but rather to be major partners. This perspective is reinforced by the special roles state and local governments play in the process of federal information dissemination. Not only are state and local officials major users of data, but they play indispensable roles in the gathering and transmitting of data as well. In addition, they manipulate data both for themselves and to meet federal requirements, and they regulate data within their own spheres. These special roles deserve special consideration from the makers of federal information policy.

One area where state and local agencies feel they deserve special consideration is information cost. In most cases, federal data is collected at the state and local levels. Having transmitted this information to the federal government, these agencies do not want to pay for what they consider to be their own data. This is one reason why state and local officials are uneasy with the growing role of the private sector in federal information dissemination. But pressures to make money from information do not come only from the information industry. The Office of Management and Budget also currently supports this idea. For example, some state officials cite OMB Circular A-130 as an example of an intrusive attempt by the federal government to privatize information gathered at state expense. Even the User Services Division of the Census Bureau worries that OMB will require them to sell data for more money. [8] (For further discussion of cost and privitization issues, see Section III.)

The Census Bureau provides an excellent example of the special role that state and local agencies play in the dissemination of federal information. The State Data Centers Program, to which all fifty states subscribe, is a cooperative program intended to make states the primary distributers of census data. In return, states receive technical support, but no money.

In its current form, the State Data Centers Program is uneven and only partially successful. In some states, such as Minnesota and New York, the state data center has become one of the focal points for state data projects, linking governmental, educational, and private data efforts. In other states, such as Washington, the state data center is less visible and tied primarily to state universities. Many state data center people claim that problems with the system derive primarily from the failure of federal data to be easily accessible, relevant, consistent, and usable at state and local levels. At least on the accessibility issue, recent Census Bureau initiatives for electronic dissemination seem to indicate an awareness of the problem and a willingness to improve matters.

In addition, state data centers often are not satisfied with the level of support they receive in exchange for the dissemination services they provide. When compared to other cooperative programs, such as BLS support of labor market centers and USDA support of state agricultural groups, state data centers feel they get relatively little from the Census Bureau.

On the other hand, the Census Bureau is dissatisfied with what it claims to be an inability of state data centers to get economic data to the private sector. [9] As a result, it has begun a Business-Industry Data Center Initiative to help get economic data to business and industry. Arguing that economic data should come from many sources, the bureau is also looking for other local non-profit agencies to deliver data to the private sector.

Whatever the actual state of affairs with the State Data Center Program, it was generally clear throughout our study that state and local officials do not feel they are adequately considered by federal information policymakers. The states worry that the framework to be used for decision analysis of current federal information alternatives will emphasize federal and private criteria at their expense. They may be right, if the special roles state and local agencies play in the process are not adequately considered. New federal initiatives on information dissemination will not be successful if the state and local perspective is not reflected in their structure and implementation.

I.F. State and local officials prefer small, well-defined changes based on specific needs to major federal modifications with far-reaching implications

Federal decisionmakers currently face a wide range of policy alternatives for federal information systems. Choices range from doing nothing, to specific modifications and additions such as electronic index and press release services, to more general policies such as electronic publication and dissemination standards, to major and far-reaching modifications such as a governmentwide integrated database and new Government Information Office. In addition, each of the possible alternatives can be implemented in a range of ways, for example, the electronic index could simply be bibliographic, or it could include an abstract service, or it could even include foreign documents and a translation service. Faced with this myriad of possibilities, state and local officials express a myriad of responses. In general, however, they prefer small, well-defined changes based on specific needs to major federal modifications with far-reaching implications.

One reason for this preference at the state and local levels is the general belief that so much is wrong with the current federal information system. In a sense these officials are saying, "Show us you can do something small right before you try something bigger." Most agree, for example, that a complete online index of government publications would be extremely useful and much easier to access, search, and maintain than the current Catalog of Government Publications. Most also agree that online abstracts could be extremely useful as well. But even a well-defined electronic bibliographic index is not easy to create in a useful form, and many online indexes covering far less territory have been very poorly done. State and local officials want to see a well done electronic federal index before considerable efforts are spent on abstracting and translation services as well.

Similarly, in the area of reorganization, state and local officials recognize the benefits that could be derived from a strong, centralized Government Information Office. All, for example, complain about the inconsistency of federal information policy and point out the need to decrease the redundant gathering of data. Certainly a GIO would be in the position to improve these problem areas. But generally, state and local officials are nervous about the centralization of federal information authority. They want gentle coordination, not a strongman. They have seen how centralization of power can bring abuse.

Many state officials point to the OMB as an example of how centralization of power can bring abuse in federal information policy. A current source of state and local anger is OMB's July 24, 1987 decision to unilaterally cut about 30 questions from the 1990 census. State and local officials, such as the State Demographer of Minnesota and the Project Director of the City of Milwaukee's Data Services, are concerned about the loss of information that they need, especially in the area of housing. But perhaps more important than the lost data is total disregard by OMB of the process which led to the inclusion of these questions, a process which considered the needs of diverse data users across the country. As the Census Bureau put it in a recent electronic bulletin:

> The questionnaires submitted to the OMB marked the conclusion of the most exhaustive content development and testing program in the Census Bureau's history... Candidate questions for the 1990 census were not selected unilaterally by the Census Bureau. The content development

> process included methodical evaluation of the 1980 census; recommendations received at local public meetings across the Nation; consultation with minority and technical advisory committees; identification of governmental data needs through interagency working groups and the Federal Agency Council. New or modified questions resulting from the development process were tested in the National Content Test, the test census program, and special-purpose surveys.[10]

Yes, state and local governments recognize the potential benefits of a well run GIO, but they are concerned about the potential abuses which could result from such an office as well. Faced with the seemingly arbitrary actions of OMB, their concerns appear to be justified.[11]

State and local skepticism about many of the more far-reaching alternatives to revamp federal information policy is not born from an ignorance of the need for major revisions to improve the system. These officials are acutely aware of existing problems and the benefits of integrated data and consistent data management policy. They are just not convinced that major projects such as an effective governmentwide integrated database can realistically be achieved at this time, and they worry that the authority necessary to create them might do more harm than good.

I.G. State planners need federal information that is more easily found, more easily accessed, more carefully documented, more timely, and more suitably packaged for their particular state

A major split of state and local users of federal information can be seen between administrators and planners. Administrators are generally swamped with tasks related to tracking great volumes of data and delivering money and services. They do not, as a rule, have time to seek out more data than they absolutely need or to explore innovative ways to access, manipulate, and transmit that data. This is not to say that administrative data users aren't innovative or imaginative, only that time constraints encourage a conservative attitude. Planners, on the other hand, are energetic in their searches for new sources of data, more experimental in their efforts to access and manipulate it, more thorough in their questioning of data quality and applicability, and more concerned with the timeliness of the information. In general, planners are not satisfied with the present federal information dissemination system, especially when they desire data for prospective legislative planning rather than for retrospective historical and administrative recordkeeping.

Planners find electronic communications between themselves and federal information sources to be overly complex and insufficient. Minnesota demographers, for example, said they got some information from Census Bureau electronic bulletin boards, but complained there were just too many b-boards to keep track of (several just in the Department of Commerce). In addition, they felt that two-way communication was needed, enabling them to provide information as well as receive it.[12] Improved electronic connections could help federal as well as state planners.

There is far more to improving information exchange than simply improving electronic connections. Another major problem is making people aware of what information is available. State and local officials often complain that there is simply too much federal information produced to keep up. The possibility of a comprehensive online federal index was one of the information alternatives most positively received at the state and local levels. Such an index, however, must have a sophisticated search mechanism to take advantage of the bibliographic data in electronic form.

Information can be disseminated actively or passively, and there are many levels of active dissemination. One can, for example, simply provide a link through which information can pass, provide a link with a listing of the information available, or provide a link with a sophisticated interface that helps users find information relevant to their needs. Planners require extremely active dissemination, and have experimented themselves with user helpful systems on the state level (see Section II).

A sophisticated user interface can do more than help make users aware of what information is available. It can also help people use the online information more effectively and appropriately. Data for sophisticated planning must be carefully analyzed to determine its appropriateness to the particular state and situation being studied. Many planners and most legislators do not have the expertise to perform this kind of data analysis. New expert system and interface techniques, however, make it possible to incorporate this expertise into the information system. Federal alternatives currently place little emphasis on this crucial area of interface design and development, but some state planners are actively exploring this option (see Section II).

In addition to improvements to the capabilities of user interfaces, state and local planners require considerable more data about the data (**metadata**) in federal information systems. Data without documentation is at best useless and at worst misleading. What is the source of the information? When was it gathered? What instrumentation was used? What are the definitions of key terms? Was the measurement over time or at an instant? For what purpose was it gathered? What other versions of this information exist? What adjustments have been made to the numbers? These are just a few of the questions which must be answered before a determination can be made as to the quality of data or its applicability to a particular situation. Numbers alone mean nothing, and current information dissemination does not provide sufficient metadata either through the interface or the database itself.

Timeliness of data is also an issue of particular interest for state and local planners. When the state legislature requests information and analysis from state planners to help make budgetary and policy decisions for an upcoming session, up-to-the-minute data is essential. Generally, legislatures want projections on the future impact of today's decisions. This cannot be done with old data. One of the greatest strengths of electronic dissemination of federal information is the potential for rapid updating and sharing of data. As yet, however, the coordination needed to realize this potential has not exited.

Timeliness is an issue for other forms of information besides data. The possibility of a governmentwide electronic press release service was well received by state planners and information centers as a well-defined, workable, useful project. Some state information centers who are supposed to serve as a source of information for the media said it would be nice, for a change, to receive government press releases before the press does.

In general, planners, like everyone else, require federal information that can be adapted to their particular needs. As we have seen throughout this section, this is usually not possible. In fairness to federal agencies, it is a tremendously difficult job. The diversity of needs at the state and local levels is immense. Planners differ from administrators, states differs from counties, states differ from each other, data uses differ even within the same state or local unit, definitions differ, perspectives differ, needs differ, and technology differs. It is much easier to make an information system that functions than it is to make a functionally useful information system.

At present, state and local officials are frustrated with the huge effort they put into information collection for the federal government and the little useful information they get in return. They are also not particularly optimistic about new intiatives to improve federal information dissemination. However, state and local officials see themselves as major partners in the dissemination of federal information, and they are willing to play their part in the considerable effort that will be required to create a truly useful governmentwide information system. They're just not sure they'll be asked.

II. State and Local Practices as Possible Models for Federal Information Alternatives

Numerous government agencies have rushed to apply new information technology to the acquisition, storage, manipulation, dissemination, and application of governmental information. As in the currently decentralized federal information situation, there have been a great number of individual, uncoordinated efforts at the state and local levels as well. Recently, however, many states are putting more and more effort into the management, coordination and distribution of these efforts. In addition, a few interstate groups are attempting to establish and expand shared interstate information networks. This section will present the highlights of some of these efforts and discuss their application to the present federal information policy alternatives.

The following general areas and specific efforts will be discussed:

A. Governmental Budgetary Information Systems--The New Hampshire Integrated Financial System

B. Centralized Government Information Agencies--Washington's Department of Information Services, Minnesota's Information Policy Office, New Jersey's Office of Telecommunications and Information Systems, and New York's Forum for Information Resource Management

C. State Efforts to Accommodate Diverse User Needs--Minnesota's Intergovernmental Information Systems Advisory Council and Washington's Office of Information Services

D. Online Data Services--Minnesota's DATANET, the National Governor's Association's State-TIES, the Council of State Policy and Planning Agencies' State Scanning Network, and the Council of State Governments' ISIS

II.A. Governmental Budgetary Information Systems--The New Hampshire Integrated Financial System

One of the first things Governor John H. Sununu did upon taking office in 1983 was to install a state-of-the-art integrated database for all state financial information. He did this in response to an almost $50 million deficit and an antiquated batch system that failed to provide him with the data he required. The New Hampshire Integrated Financial System, under the Department of Administrative Services, went online in July 1985 with applications covering central accounting, payables and budget control. In 1986, a personnel application was added. Today, New Hampshire is in the black, and while the financial database is just one of many tools that have helped improve the economic climate of New Hampshire, Governor Sununu claims "we have been able to capture about 1% to 2% of the state budget by virtue of this access to data alone." [13]

Governor Sununu claims to know more about budgetary matters in his various state agencies than do the heads of those agencies, and he makes no bones about using this information as a fiscal weapon. "One of the reasons for going to this kind of system, with the kind of access that a chief executive has under it, is to let them know that we probably have more data than they have. It's amazing how it improves the quality of response that you get." [14] The Governor plans to add budgeting, purchasing, and payroll functions to the system. But more important to a study of federal information dissemination alternatives than the success of Governor Sununu's system are some fascinating political policy side-effects it has spawned in New Hampshire.

Recognizing a system that provided useful information, the New Hampshire Legislature decided it, too, should have access to the New Hampshire Integrated Financial System. Governor Sununu said no. As of July 1987 there had been 11 legislative proposals to open the system to outside access. All were blocked by Governor Sununu, who joked he couldn't sign a bill without checking for a rider about the system. [15] The arguments, which lead to litigation (now settled out of court), have implications far beyond a state budgetary system and are important to consider in light of increased reliance on new technology for federal information access, storage, and dissemination.

The legislature argues that public money was used to establish and maintain the system and therefore the system must be open to public access. They further argue that information is a resource to be shared, not hoarded.

The Governor responds with two arguments. First, he sees the legislature's attempt to gain access to the system as an intrusion on the powers of the executive branch. Second, he equates searching through his database to appropriating his files. He provides a report to the legislature on any subject they choose, and he will use whatever resources he has to prepare that report, including the financial system. As Stephen Kennedy, Commissioner of the New Hampshire Department of Administrative Services notes, "We choose format, but never refuse access." [16] The Governor would no more, however, let other legislators search for information in its uninterpreted, database form than he would let them walk into his office and look up the subject in his file cabinet. [17]

The implications are far-reaching; in fact, Governor Sununu claims that future battles on the federal level between the executive and legislative branches will be fought over access to electronic data.[18] It is also likely that battles between states' rights and federal authority will be fought on similar grounds. If Governor Sununu is right, these battles will be strongly impacted by the decisions about federal information dissemination being made today. (For further discussion of these issues, see Section III.)

II.B. Centralized Government Information Agencies-- Washington's Department of Information Services, Minnesota's Information Policy Office, New Jersey's Office of Telecommunications and Information Systems, and New York's Forum for Information Resource Management

The issue of data ownership is one factor that has contributed, in some states, to attempts to establish central authorities for regulating information use and technology. Perhaps contrary to Governor Sununu's position, Washington, Minnesota, and New Jersey have new units whose aim, among other things, is the sharing of electronic information between state agencies. In addition to information, these units attempt to share expertise and coordinate technology as well. These state efforts to coordinate information policy are particularly interesting in light of Rep. Brown's proposal for a Federal Government Information Office.

The process by which Washington's Department of Information Services was created may demonstrate, on a smaller scale, some of the pitfalls facing attempts to create a Federal GIO. As originally proposed, Washington's DIS was intended to be a strong, centralized authority for information management in Washington's state government. Substitute Senate Bill 5555, however, went through numerous iterations, was reviewed and criticized by each agency, was rewritten to take out terms like "technological planning," and ultimately created a weak group quite different from what the proposers had intended. Thus, while the bill's intent is that "information be shared and administered in a coordinated manner," the bill goes on to state that "primary responsibility for the management and use of information, information systems, equipment, software, and services rests with each agency."

Why are state officials so reluctant to create a central coordinating body for information efforts? Most officials are strongly tied to their current systems and worry about imposed changes by a single authority. Some look at how difficult it is to get information from their present agency information services group and decide it would be even worse to get anything from a more complex state-wide group. Some worry about the abuse of centralized power. These and similar reasons are likely to affect federal agency officials as well, making them reluctant to support the creation of a strong federal information coordinating body. If the State of Washington's government cannot be persuaded to exchange agency authority over information for a centralized authority, what possibility is there of doing the same at the federal level?

Perhaps more successful is Minnesota's attempt to coordinate state information policy and systems. One definition of this attempt was contained in a November 1986 policy statement entitled "Minnesota Information Management Principles" which emphasized four things: (1) the need to link systems to diverse agency missions; (2) the fact that "All data collected, generated and used by state government must be treated as a resource of the state to be managed and shared across organizational lines;" (3) the need to establish a common state system architecture; and (4) the need to accommodate the diverse information needs of people. The statement, developed and unanimously endorsed by the Department of Administration's Information Policy Council, has had an effect on departmental information policy.

These efforts in Minnesota to coordinate information policies and systems culminated this summer with the creation of an Information Policy Office under the Department of Administration. As in Washington, the actual legislation is less ambitious than the initial coordinative desires, but Minnesota's Department of Administration feels there is room for a broader perspective. As they say in a discussion paper,

> Our approach, and the approach of agencies that have implemented their own systems, has been to assure that the correct computer service or computer system, software, and networking facility if required, is provided to meet the needs of the agency. Not too surprising, based on the wording of the legislation, the principal concern of the legislature appears on the surface to be improving decisions about computer and technology purchases.
>
> A broader perspective and orientation can be suggested for the Information Policy Office -- one that may be expected to improve information delivery system decisions. It begins with an assumption about how information system decisions can best be made. Simply stated, it requires first of all an analysis of the larger information requirements of an organization as the basis for later decisions on information delivery systems. [19]

The impact of Minnesota's new Information Policy Office has yet to be felt. Nevertheless, we see here that state officials are backing up their calls for greater federal attention to the diverse needs of users with efforts of their own within their states.

Similarly, New Jersey's Office of Telecommunications and Information Systems aims to be, first and foremost, a "needs-responsive organization." This office, located in the Department of the Treasury, is not as centrally positioned as Washington or Minnesota's groups to carry out its mission of "leading the information processing activities throughout New Jersey state government into the foremost dimensions of technology." [20] Nevertheless, OTIS is the central computer office for the state and is one of the oldest and largest state units of its kind, having begun in October 1984 and housing an Administrator, three Deputy Administrators (Design & Development, Information Processing, and Finance & Administration), and 17 Directors. This office has been particularly effective as a center for training and information sharing, and has confronted policy issues in the areas of information sharing, pricing, ownership, and access.

In New York, the Rockefeller Institute of Government, a public policy institute associated with the State University, has established the New York State Forum for Information Resource Management. In this organization, managers of state agencies maintain a network to exchange information and experience. Members develop cooperative projects, promote standards and guidelines for integration, provide backup for information systems in emergency periods, work on information resource policies for the state, maintain liaison with the academic and private sectors, and conduct seminars and other educational training activities (on topics such as diffusion of information technologies in government, information sharing, the balancing of the "access/security paradox," and "life cycles" of information technology).

Support for the New York State Forum for Information Resource Management is provided partially by major private sector companies, but the main backing comes from the State's Budget Division following the lead of the Governor's office. Although there is much talk about integrating information systems, only two examples currently exist--one in criminal justice and the other concerning children and families.

While no state unit currently exists with complete authority for statewide information systems and policies, a number of efforts are underway to approach this goal. State legislative and agency resistance to creating an information strongman probably reflects similar difficulties that any effort at the federal level must face. Perhaps most importantly, however, state coordinative efforts are based on attempts to face the difficult task of meeting diverse agency and people needs, and this is something which federal information policy needs to emulate.

II.C. State Efforts to Accommodate Diverse User Needs--Minnesota's Intergovernmental Information Systems Advisory Council and Washington's Office of Information Services

State efforts to accommodate diverse user needs are not restricted to attempts to create statewide coordinative bodies. A number of smaller yet interesting efforts exist. Given the difficult nature of this task and the many complaints that federal informations systems fail to do this well, we will discuss two of these efforts as being illustrative of possible federal options.

Minnesota's Intergovernmental Information Systems Advisory Council (IISAC) is a unique effort to accommodate local information needs within state information systems. In many ways, this situation can be seen as a microcosm of the federal problem with accommodating state information needs. It must be remembered, however, that there are fundamental differences between the relationship of state and local government and the relationship of federal and state government.

The IISAC funds a variety of research and evaluation efforts in an attempt to integrate diverse local perspectives on information dissemination with information projects at the state level. A recently funded study, the "Intergovernmental Information System Evaluation," recommends a set of policies to make state information systems more responsive to the needs of users. This study also encourages cooperation by local governments to provide support and direction at the local level and to eliminate redundant efforts.

The IISAC study covers several State of Minnesota computer systems which have a significant role in local government with the objective of determining "the extent to which each of the systems meets the current information needs of local user agencies and the State."[21] The evaluation takes into account the views and opinions of the support staff and the users for each of the systems. The systems examined include the Detention Information System operated by the Department of Corrections, the Trial Court Information System used by the State Supreme Court, a Fire Incident Reporting System used by the State Fire Marshal's Office, several financial systems operated by the state Department of Revenue, and others.

The result of this evaluation is a set of progressive recommendations to make state information systems more responsive to local user needs. The recommendations include: the state should ensure that there is an "appropriate" level of local government involvement in the development, modification, and maintenance of every state information system so that it meets the needs of the local governments and provides accurate data to the state; every cost benefit analysis of proposed state information systems should address the costs and redundancy that would be imposed on local governments with the aim of reducing this whenever possible; electronic access to state information should always be provided -- unless the information is confidential -- to help eliminate the duplication of state and local data collection efforts and to allow greater flexibility in local reporting; the state should take the lead in coordinating local data systems and collection efforts by actively soliciting and consolidating local issues and requirements; and a continuing effort must be made by the state to educate local government and the public in data access and use, to arrange studies of user involvement, to support system definition and monitor system development, to identify other state information systems which should be made to follow these recommendations, and to generally ensure that state information systems are responsive to the needs of local governments and private citizens.

Another departmental effort with an equally comprehensive program to accommodate diverse user needs is a project within Washington's Office of Information Services known as Project Giraffe. Project Giraffe is an ongoing effort by OIS to avoid being a "black hole" for information. Since this is something many state and local officials accuse the current federal information system of being, Project Giraffe has potential application to federal reorganization of information policy. It also serves as a good example of the active interaction between users and systems personnel required to create a truly responsive system.

Project Giraffe is a reorganization and refocusing of the Information Services group for the largest government department in the state of Washington. Washington's Department of Social and Health Services is made up of an extremely diverse set of agencies covering officials as different as state epidemiologists and welfare check distribution clerks. All together, it has over 14,000 employees. Serving the information needs of these numerous and diverse users was clearly a problem, since Project Giraffe was initiated in response to charges of OIS unresponsiveness bordering on capriciousness.

Project Giraffe began with two one-day sessions, in house, at which senior managers of OIS were brought together with their agency counterparts to begin synthesizing the views of system operators and users. This was followed by two 2½ day sessions away from work with a facilitator. At these sessions, a modified Delphi process was used to set priorities and determine what should and shouldn't be done in the future. Within two weeks initial reports were sent to all involved and within six months, a major update was prepared. This update and feedback process will continue on a regular basis, with new people being introduced to the project every six months. Initial results have been encouraging, and general organizational spirit has been much improved. Problems still exist, but progress exists as well.

As we have said, it is not easy to establish an information delivery system that is truly responsive to user's needs. Raising the kind of effort called for by the IISAC or expended in Project Giraffe to the federal level is an imposing task, but when the cost of systems which may or may not do what people want is considered, the effort is appropriate. Whatever the level, effective management of information technology requires a formal system for constant and significant input from end users.

II.D. Online Data Services--Minnesota's DATANET, the National Governor's Association's State-TIES, the Council of State Policy and Planning Agencies' State Scanning Network, and the Council of State Governments' ISIS

A number of the current federal information alternatives include the establishment of national information services. Among these possibilities are a national online index of available government information and a governmentwide integrated database. Related efforts at the state and interstate levels can serve to highlight some of the promise and pitfalls of efforts like these.

Perhaps the most successful effort at the state level to integrate and provide general governmental data in a useful form is Minnesota's DATANET system. DATANET is the most sophisticated delivery arm of a much larger information effort known as the Land Management Information Center (LMIC), which resides within Minnesota's State Planning Agency. The system began about five years ago and was given a mandate from the legislature to do a better job of monitoring land use change. This effort has evolved into a subscription service with a general revolving fund, and a mandate to operate on a self-sustaining basis. Its clients include state agencies, private business and industry, libraries, and educational facilities. All are charged equally, ½ for online time and ½ for maintenance, training, and other services. Currently their fees cover approximately ¼ of the system's costs.

Only a fraction of LMIC's large inventory of online databases has been incorporated into the expanding DATANET system, but DATANET does contain a significant selection of census, agricultural, and labor data. The system contains no private data, only public information. Perhaps most useful are the system's efforts to provide a helpful, functional interface that guides the user not only in locating information, but also in making statistical adjustments to the data. In the principle investigator's first DATANET session, for example, he got a listing of all state rankings in which the state of Washington was in the top five, looked at one--the table listing number of communications employees by state, accessed the table of state population for the appropriate year, and created a new table displaying a population adjusted ranking of states by employment of communications personnel.

This process was not achieved without a few difficulties. The interface design needs improvement and there was a bug in the data concerning Delaware, which could not be adjusted for population. In addition, metadata is restricted to data sources and a number of issues such as responsibility for data are yet to be addressed. But overall, the data in the system is relatively easy to access and, with a minimum of training, capable of being statistically manipulated in a useful way. Considering the difficulty in creating a useful integrated database, DATANET is a significant beginning that allows users to combine data across agency lines.

DATANET officials expressed dissatisfaction with federal data, particularly in the areas of timeliness and consistency. They cited the five month lag in receiving county business data from the Department of Commerce, stating that states with online information programs should receive a higher priority in the distribution of data tapes. They also mentioned the lateness of agricultural data, stating that data generated by the state by June was delayed because it had to go to D.C. and come back before it could be incorporated in the system. [22]

DATANET raises a number of questions for federal consideration, many of which will be discussed further in Section III. Will increased distribution priority to states with online database projects further increase the already significant gap between the have and have-not states in terms of technological information access? Who is responsible if someone sues over actions taken based on incorrect data, or use of data, obtained through the DATANET system? Should DATANET be charging governmental and educational facilities the same rates as private corporations?

This last question is particularly appropriate in light of a dissatisfaction with DATANET expressed by the Minnesota Department of Transportation. Minnesota DOT claimed that they had expended considerable effort to provide transportation data to the DATANET system, even helping in the work done to reformat and transmit the data. They were unhappy, therefore, when DATANET officials said they had to pay the same rate as anyone else to access the system, even to retrieve their own data. [23] It is fascinating that this same complaint, heard so often by state agencies dissatisfied with the cost and labor required to access their own data from federal sources, would be heard within the state level as well.

Whatever its present and future problems, the DATANET system is an admirable and largely successful effort to integrate across-the-board governmental data and package it so that diverse and relatively inexperienced users can make valuable use of the available data. It is more technologically advanced than any of the interstate systems currently being developed and operated by the National Governor's Association (NGA), the Council of State Policy and Planning Agencies (CSPA), or the Council of State Governments (CSG). Because these organizations are particularly well placed to develop effective interstate systems, however, their current operations and plans are worth examining.

NGA's effort is called the State Telecommunications and Information Exchange System (State-TIES). Its goal is "that Governors and other State Government officials are able to communicate information interactively and gain access to timely, accurate, and reliable information that they can evaluate to make sound decisions and responses on issues of critical national importance."[24] The system has two parts, Information Processing Services geared toward developing and accessing databases like those available through DATANET, and an Electronic Mail Service to allow NGA members to communicate through electronic mail and bulletin boards. Most of the database effort is still in development and plans are extremely ambitious. The electronic messaging component is currently available only to members of the NGA Executive Committee and Standing Committee Chairmen.

At present, State-TIES may be most worthy of note because of the recent appointment of New Hampshire Governor Sununu as Chairman of the NGA. Should Governor Sununu turn his attention to this system, and should sufficient resources be found, Governor Sununu may well lead the State-TIES effort towards advances similar to those made in his home state.

CSPA's State Scanning Network is based on work done in Florida and Minnesota to identify "emerging issues important to Governors and other executive level state policymakers in state government."[25] The system uses ten states to review an array of journals and research reports and then select the most significant issues. A National Scanning Board made up of members from the public and private sectors reviews these issues and summarizes them in a printed Report to the Governors. Future plans are to expand the number of states in the scanning process to twenty and to make the results immediately available to every Governor's office through an electronic network, perhaps in cooperation with State-TIES. The ultimate goal is "a powerful method to help the nation's state policymakers identify emerging problems and opportunities, locate additional information and qualified experts, and learn from the early actions of others faced with the same challenges."

CSG's Integrated State Information System (ISIS) is a bibliographic service and library currently all in hardcopy; but plans exist to go online, perhaps in cooperation with State-TIES. ISIS' library has over 20,000 volumes in it, specializing in documents of interest to state officials. Currently, states must write or phone to request documents but ISIS plans to accommodate online requests as part of their future electronic service. Their present service is free to state governments.

Even though they are specialists in the bibliographic field, ISIS personnel have a difficult time keeping up with what is available from the federal government. They say it is fairly easy to locate information if they know the appropriate agency and the appropriate person to speak to, but this is often not the case. However, ISIS personnel do not think centralization of federal information is the answer; they worry that this would simply create an additional middleman who would hinder information access.[26]

With more resources and better coordination, State-TIES, the State Scanning Network, and ISIS could make a strong core for developing an all-purpose information network for state planners. Currently, however, their resources are too limited and there is too much duplication of efforts.

Federal information policymakers must understand the considerable effort required to successfully carry out proposed information alternatives before embarking on them. Any analysis of effort must go beyond machine and network requirements to the design of interfaces and other means of meeting user requirements. At present, interstate efforts have yet to achieve even more modest information goals than those contemplated at the federal level.

III. State and Local Concerns Over Policy Issues Related to Federal Information Alternatives

In the course of our research -- particularly in the course of our conversations with state and local officials, representatives of federal information activities, persons involved in interstate information networks, and members of the private sector -- we had many productive discussions dealing with policy issues relevant to the larger OTA study of which our project is a particular part. The first two sections have introduced some of these broad policy issues which stem from, but go beyond, specific federal alternatives for information dissemination. Our purpose in this section is to further raise some of the broad issues which surfaced during our work, and to highlight some of the conflicting values which are present in these policy issues, particularly as they are perceived by state and local officials.

The following issues are discussed:

A. Privacy and Security

B. Ownership and Cost

C. Privatization of Information

D. Equity of Access

E. Responsibility

F. Open Government

G. Technology and Government Operations

III.A. Privacy and Security

For purposes of our discussion, we will define privacy as the right and/or expectation of being able to limit dissemination or to control information about oneself. Related to this concept is the understanding that information that is given to the government (sometimes voluntarily and sometimes under compulsion) will be used only for the purposes for which it was given. Although some states have explicit constitutional provisions and/or legislative enactments dealing with privacy, or may have some relevant judicial case law, privacy law is not well developed at the federal level. There are court decisions (including important and controversial ones such as Griswald v. Connecticut; Roe v. Wade, and Bowers v. Hardwick), which have begun to develop a right to privacy, based on the 9th Amendment, and indicate that it might have some limitations. As a result, if there were to be an integrated data system it would have to contend with a wide variety of legal regimes regarding privacy notions, unless an explicit federal policy on privacy governing all federal information was adopted.

Many discussions of information technology and privacy limit the latter concept to concerns about information sharing or dissemination, but here, as with system development and use, information dissemination cannot be considered in isolation from information gathering. Thus, privacy considerations attach even at the stage of information gathering. Particularly where government uses the threat of sanctions to compel individuals or organizations to disclose information, respondents must forego control of some sort over information about themselves, a diminution of privacy. This consideration is likely to increase in importance as electronic information systems greatly expand information capacity and the demands increase for additional information to "fill" these systems.

As a New Jersey information official commented, "We have the potential to create a 'Big Brother' society. State government computers contain much information that is generally considered to be private and confidential, and the indiscriminate exchange of personally identifiable information constitutes a threat to individual privacy." [27]

The notion of privacy potentially conflicts with two other important variables which will be discussed subsequently in this section: Open Government and Information Sharing. The more that government information files are open to perusal by increased numbers of persons, the greater is the potential loss of privacy on the part of persons who have information about themselves stored therein. A major factor in evaluating this potential conflict is the actual nature and format of the information--for example, to what level is the data disaggregated? Are individuals readily identifiable as a result of this packaging? Protecting the right of privacy leads inevitably to considering a reduction in the sharing of information.

Thus the right to privacy may conflict with notions of rationality and increased technological compatibility. The logical extreme of one big integrated system would presumably mean that data about individuals arising from very disparate sources in governmental programs could be "matched" or coordinated. Already situations of "computer matching" have lead to serious public policy problems concerning questions of fairness or equity. In a well known situation arising a number of years ago in Massachusetts, bank records about deposits were matched with records of welfare recipients and every individual who was identified by a "hit" was purged from the welfare rolls, despite the fact that legal regulations allow welfare recipients to have bank deposits of up to specified amounts in certain circumstances. This is another illustration of how information for one situation may not be appropriate for another, and of the importance that metadata plays in the determination of public policy and rules about online information.

"Security" is a concept relating to the ability to control access and the use of information within agreed upon limits. Many of our respondents did not see this as much of a problem; the well publicized situation of "hackers" running amuck through computer files did not, in reality, seem to be too critical. Security considerations need to be built into a system and need to be responsive to the context within which the particular data was collected and exists. To some extent, increases in security may meet certain privacy concerns (but, by definition, not those which relate to the gathering of the information). Security of particular information could be compromised by the integration of different data into larger systems.

III.B. Ownership and Costs

The major underlying consideration regarding data ownership and cost is the extent to which data is considered either a resource or a commodity. Data has economic as well as political and educational value. Does increased dissemination of particular data increase or decrease its value? A Minnesota planner said that despite his state's policy of interagency sharing of information, some officials still saw information to be a resource like oil--to be hoarded away until needed and then charged for accordingly. He, on the other hand, felt that the more information he gave away, the more was wanted.[28] Information can be power, but is it more powerful as a shared or as an owned resource?

By now it seems fairly well established (in federal and state freedom of information acts, for example) that the information that government produces is a public good and perhaps even a free good. The difficulty comes in separating this "free" data from its compilation, manipulation, reproduction, and transmission, as well as from ancillary aspects such as manuals and other user support activities. The data itself should be free, but which of these so-called "value-added" activities is fair game for charges, and how much? Concerns about ownership and cost of data relate to the issue of equity of access (for example, the Freedom of Information Act contains provisions guiding when the imposition of charges should be waived) and privatization (can there be charges imposed for the data itself if that information is being provided by a private entity?).

Some of our respondents exhibited explicit nervousness about whether state and local entities will continue to be able to get information at no cost. In addition to seeing this as related to access (see Section D below), many officials felt that their agency budgets would not be able handle the imposition of additional costs; libraries were a particularly poignant example of this position.

An ancillary issue is whether or not the format of information -- specifically whether it is printed or electronic -- should determine whether the information is an official government "document," whether it should be distributed for free, and the like. A

New Jersey official used the example of maps; when the state's Department of Environmental Protection produces customized maps printed on paper, it charges from $1.30 to $2.70 but when maps are supplied electronically they are free. The official suggested a number of questions that this raises:

> "How are the prices determined? Do maps produced by the Department of Transportation have similar prices? Does the price capture the cost of sending a helicopter up for an aerial photograph? Is it reasonable for a state agency to try to recover the cost of producing a map even if the information would be collected by the agency anyway? Why charge for paper but not for information provided electronically (I think this has something to do with our records management laws -- electronic information doesn't get classified as a 'document')?" [29]

III.C. Privatization of Information

Some information is proprietary and some information which government has may be argued to be proprietary. If private industry controls certain information which has some governmental character, the strong possibility of a conflict arises between the values of open government and equal access to information by citizens, on the one hand, and concerns about profitability on the other (which are predicated on notions of restricted access and scarcity). For example, the federal Freedom of Information Act provides that charges for the gathering and reproduction of public information can be waived if it is in the public interest to do so (and some specific examples are included).

Most respondents accepted the fact that information which is otherwise public could be manipulated, packaged, and/or analyzed by private entities and thus made into a commodity. Indeed, the analytic function was suggested as a primary example of the role that private industry should play with regard to public information. The recently issued OMB circular A-130 raises this issue; most (but not all) state and local respondents believed that it went too far in the direction of privatizing public information. (See Section I.E.)

Even if the information (perhaps packaged or massaged) is seen as valuable and worthy of bearing a price, a secondary issue is who should bear the costs -- the specific users or the public in general. For example, the FOIA waiver provision noted above in essence accepts the fact that there will be certain costs associated with information (but note, in this instance, not for the information itself), but understands that in some situations the larger public should bear them rather than the direct user.

III.D. Equity of Access

The notion of "equity" embodies a belief in fairness; that like individuals should be treated alike in similar circumstances. In other words, the underlying issues often concern where one wants to draw the line between likeness and difference. In regard to information policy there are at least two other analytic distinctions which are helpful in exploring the questions of equity of access. The first relates to what can be called "active" versus "passive" information dissemination. Active dissemination refers to situations in which the holder of information (for example, a government agency) takes explicit steps to alert potential users to the existence of information and ways to access it. The agency may provide online menus, user conferences and training, bulletin boards, mailings, and the like -- efforts geared to increasing knowledge about the information's existence, location, and the means of retrieving it. Passive dissemination, on the other hand, refers to situations where a potential user has the means of getting hold of certain information but either doesn't know of its existence or is unaware of how to use available equipment to access it. Since the procedure can be extremely complicated, the later is a common occurrence.

A similar distinction could also be made between "formal" and "actual" access. Formal equality of access refers to the existence of legal rules which assure that like groups of potential users will be treated alike. The actual access situation is, as its name implies, concerned with the reality of access: Who knows that information exists? Who has the capacity (technological, intellectual, etc.) to acquire and utilize the information?

The underlying question here is not one of needs but rather has to do with technological sophistication as a criterion for equality. For example, upon entering the Seattle Department of Land Use you face a counter where you must wait for workers to take your specific questions; then you must wait again for workers to answer them. On your right, however, are open terminals at which anyone can sit down, punch a few keys, and get not only the answers to their questions, but additional information listed on the screen about which they might never have thought to inquire. Anyone can use these terminals, but only those knowledgeable and comfortable enough with computer searches do. Not only are the terminal users saved considerable time, but, more importantly, they have the possibility of serendipitously discovering far more than their initial questions would have discovered.

Actual equality of access also differs from formal equality of access in New Hampshire, where a planner told us that many small towns did not have sufficient budgets to buy the necessary information handling equipment nor to hire trained personnel.[30] This was also seen as a problem among some potential users of information through the New York State data center. Some states (such as New York through the New York Forum for Information Resource Management) and New Jersey (through OTIS) have mounted programs which are attempting to rectify the initial imbalance which would exist among local entities and/or agencies in being able to handle new information systems. Is a lowest common denominator approach sufficient and desirable? In other words, from the federal perspective, should everything be geared to whatever the poorest/least sophisticated state can handle?

Another equity issue is presented by the pricing policy of the U.S. Bureau of Labor Statistics. The BLS has an Electronic News Release Service which charges by computer access time (a common practice). Since this access is via telephone lines, the policy means that the closer one is to Washington, D.C. the less expensive it is to receive this information. But why should Alaska pay more for this federal information than Virginia, simply because of the former's "remote" location? True, distance adds costs in many instances, but one of the promises of electronic information systems is the potential to eliminate the inequity of distance. Certainly from the federal perspective, the states are all equal, and it could be argued that federal agencies have an obligation to serve them all the same, with disparate dissemination costs being born by the federal system as a whole since all of its parts benefit when all of the parts are equally well served.

One other aspect of access and equity should be mentioned, and that is as between the different branches of a unit of government. The most notorious development of this question has, as previously discussed, occurred in New Hampshire where squabbling between the legislative and executive branches (over the former's desire to gain access to the information stored in systems of the latter) has lead to court litigation. The legislature has attached riders to various bills trying to require the executive branch to be more forthcoming with raw data and information. Because the State Department of Administrative Services operates one integrated financial system in which all executive departments and the legislature are handled together, the specific litigation turns on the apparently ancillary point of whether the legislature could control the Department's purchase of computers and the like. Certain factors about New Hampshire may mean that this sort of dispute is not too likely to appear in other contexts: it is a small, lightly populated state (but possessing the third largest legislative body in the world), there is strong state employee spirit, there is an ability of the supervising department to work at a low level of detail and keep track of the comfort level at the various other agencies, etc. But the question of whether all entities should have access to information in the same format, level of rawness or detail, is likely to be presented in other locations.

III.E. Responsibility

The notion of responsibility is a grabbag of a number of important policy concerns and values: what liabilities should there be, and who should bear them, for the misuse of information (either by negligence or intention); what liabilities ought to attach if information which is disseminated is inaccurate; who ought to assure the correctness of information and analysis which results from the manipulation, projection, or use of the originally gathered data; does an agency have to protect against incompetent usage of information in its files by others; how can restrictions on initial information be perpetuated and protected (for example, how can privacy continue to be assured as data goes through various permutations and changes and uses, how can security be maintained to insure that inappropriate access does not occur)? In particular, where does the responsibility of the system controller (the guardian of the original information) end and the responsibility of the user begin?

As a New Jersey official commented, "The government does not have absolute discretion over the information in its file. We are accountable for what we do with it. Our role is one of stewardship of information. . . when we require citizens to divulge personal information, it becomes a form of privileged communication. Compulsion carries with it an obligation to bolster the public trust." 31

III.F. Open Government

The philosophy of open government is rooted in a conception of democracy -- that all of the citizens and their organizations have an inherent and legitimate right to know about the conduct of the people's business. Information about government activities and access to the government's information about the nature of different aspects of society are closely linked in this democratic conception. Principals of open government include facilitating public access to information which the government possesses. Although the fundamental reason for facilitating such access exists in the belief that an informed citizenry can check official abuses, other values are at work also: that individuals ought to be able to derive benefit from public goods (such as public information), that education (increased access to information) is inherently a good in its own right, etc.

The issue raised for all purposes is whether or not new information technologies are neutral as regards this value of open government; in other words do the technologies themselves have some inherent effect which tends to make government more or less open? This is a very large and complex philosophical/empirical question.[32] One view (which may be dominant) is that technology in general, and information technologies in specific, are merely tools which can be used to promote either openness or secretness. A New York official told us that electronic systems are inherently more open because they provide more flexibility in packaging and thus are inherently more accessible in meeting the needs of potential users. 33 Other respondents believe that electronic formats tend to reduce openness because the great mass of citizens are put off by the equipment and the format, either because it is too unfamiliar for them, or they lack the necessary training to use it, or they lack the resources to purchase the equipment for adequate access.

The controversy occurring in New Hampshire between the legislative and executive branches of government certainly can be understood (particularly from the legislature's point of view) as a framing of issues regarding openness of government.

Related to the concept of "openness" are questions of accountability. Officials in Minnesota believe that the effect of the proposal by the federal OMB to reduce the number of questions to be asked in the 1990 federal census is not merely the saving of money but also the altering of governmental accountability. For example, the elimination of questions which would elicit data about housing might free governmental agencies from having to maintain a program of subsidization or from being accountable for the real world performance of that program.

III.G. Technology and Government Operations

To some extent, the existence of different technological configurations may themselves effect government operations. Again, this is a possible lens through which one can view the struggle in New Hampshire between Governor Sununu and the legislature. Another interesting example of this was provided by a respondent from New York. According to her, in conservative areas of the state, welfare applications used to be informally denied as part of an expression of philosophy or point of view which disfavored the notion of people on welfare. Now, however, the state requires that explicit reasons be given and documented for denial of welfare applications, basically because the information processing systems are capable of handling this sort of material. Thus the political powers of counties have been reduced in regard to the operation of the welfare program by the new technological means, and that of the state has been correspondingly strengthened. The state standards are more uniform, and the reach of the state bureaucrats is more powerful.

However, a further elaboration of this New York situation is that counties have subsequently realized an advantage in achieving their long standing attempt to get the state to be more responsible for more of the financial burden of the welfare system itself. They have done this by arguing that since the state is imposing its standards and reducing local discretion, the state should therefore be picking up a larger share of the costs.[34] As this example shows, the full range of effects of new communications technology on public policy are difficult to anticipate.

The development of definitive policies in the broad areas discussed in this section must be put off until agreement on basic definitions is reached and the appropriate questions are framed. As difficult as it is to create an information system that is truly responsive to the complex needs of its users, it is even more difficult to foresee all the legal, social, economic and moral implications of their creation.

Conclusion

Adapting Federal information dissemination to new technology requires a considerable effort not only in the area of compatibility and standards, but more importantly in the area of defining and meeting agency missions and user needs. If the impetus behind recent initiatives to coordinate and modify federal information dissemination is immediate cost savings, these initiatives cannot succeed. In addition to the necessary coordination, a greater initial expenditure of resources than is currently devoted to online information dissemination is required before future savings and advantages can be enjoyed. On the other hand, maintaining the status quo means a continuation of ad hoc efforts resulting in isolated systems that fail to adequately serve the needs of people in the state, local, public, and private sectors. Generally, state and local officials are less worried about new costs than they are eager for improvements to the current federal information system.

Now is the time both for initial steps toward agency coordination and for applications development based on analyses of specific user needs. A well designed and managed online governmentwide index, for example, would be a good place to start. Then, when the inevitable difficulties in coordination, design, development, and user response have been surmounted, more ambitious projects and broader efforts at coordination can be attempted.

Initial steps must also be taken to begin answering some broad policy questions raised by the new information technology. New definitions of privacy, security, equity, responsibility, ownership, and open government must be developed and new roles and relationships defined for people both in government and in the public and private sectors. It will be some time before definitive answers to these broad policy questions can be developed.

The resources and effort required for a major overhaul of the federal information dissemination system are immense, and such an effort must begin with a thorough analysis of the diverse suppliers and users of federal information and their complex needs. The only thing worse than attempting to accomplish too much too soon would be to do nothing at all.

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8. Personal communication from John Rowe, Information Specialist, Data User Services Division, Department of Commerce, U.S. Census Bureau, to Mark Haselkorn at the National Governors' Association Conference, *Piecing the Puzzle Together: A Conference on Integrating Data for Decision-making*, May 27-29, 1987.

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12. Personal interview between Mark Haselkorn and staff of Minnesota State Department of Administration, August 5, 1987.

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21. *IISAC Intergovernmental System Evaluation*, prepared by Grant Thornton, Accountants and Management Consultants for the Department of Administration, State of Minnesota, August, 1987,p. 4.

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26. Phone interview between Graduate Research Assistant Barbara Lewton and Debra Gona, Deputy for Policy Analysis, Integrated State Information System (ISIS), July 10, 1987.

27. Personal letter from Grayson Barber, New Jersey State Department of the Treasury, Office of Telecommunications and Information Services, dated July 6, 1987.

28. Personal interview between Mark Haselkorn and Thomas Gillaspy, Minnesota State Planning Agency, August 5, 1987.

29. Personal letter from Grayson Barber.

30. Personal interview between Philip Bereano and Thomas Duffy Senior Planner, New Hampshire State Data Center, August 9, 1987.

31. Personal letter from Grayson Barber.

32. See Bereano, Philip L., *Technology and Social Relations*, Science for the People, Fall, 1987.

33. Personal interview between Philip Bereano and Michael Batutis, Chief Demographer, New York Division of Economic Research and Statistics, August 7, 1987.

34. Personal interview between Philip Bereano and Sharon Dawes,Head of New York Effort, Rockefeller Institute of Government, August 7, 1987.

Appendices

Appendix I

Initial Contact List for OTA Study

The people on the following list were contacted by phone in order to:

1. Briefly explain the nature of our study
2. Inquire what, if anything, they are doing that falls within the scope of our study
3. Inquire what, if any, issues they feel are crucial to our study
4. Inquire who, if anyone, they know who we should contact for further information
5. Inquire whether they should (and would be willing to) be contacted again for a more in-depth interview on 2. & 3.

Appendix I

Name	Title	Organization	Phone Number
Abraham, Nancy	Assistant Commissioner	Minnesota Depatment of Administration	(612) 296-8083
Aharonian, Gregory	(private source of information software for state and local govts)	Source Translation & Optimization	(617) 489-3727
Allen, Kenneth	Executive Director	Information Industry Assoc	(202) 639-8262
Barber, Grayson	DP Analyst 2	Office of Telecommunications & Information Systems New Jersey Dept. of the Treasury	(609) 771-1847
Barton, Gerald S.	National Environmental Data Referral Service	Nat'l Oceanic & Atmospheric Admin.	(202) 673-5404
Batutis, Michael	Chief Demographer Key Contact Person New York State Data Center	New York Division of Economic Research & Statistics	(518) 474-6005
Bounpane, Peter A.	Assist. Director for Demographic Censuses	Bureau of the Census	(301) 763-5613
Clampet, Jerry	Exec Asst to the Administrator	National Agricultural Statistics Service	(202) 447-5141
Clapp, James L.	Chairman	Wisconsin Land Records Committee	(608)263-6843 262-3542
Cook, Lauren	Coordinator, State Scanning Network	Council of State Policy/Planning Agencies	(202) 624-5824
Crossley, Gary E.	Labor Market Information & Research Director	Interstate Conference of Employment Security Agencies	(202) 628-5588
Davies, Tim	Former Florida Information Official		Call Pru Adler at OTA (202) 226-2240
Dawes, Sharon	(Head of New York effort)	Rockefeller Institute of Government	(518) 472-1300
Dearstyne, Bruce	Executive Director	National Assoc. of Government Archives & Records Administrators	(518) 473-8037

Appendix I

Name	Title	Organization	Phone Number
Diamond, Stan	Research Director	Intergovernmental Cooperation Commission	(217) 782-6924
Fongemie, Ray or Leonard, Ron	LABORNET Project	Maine Division of Economic Analysis and Research	(207) 289-2271
Gage, Linda	State Demographer Director	California State Data Center	(916) 322-4651
Garnick, Daniel H.	Assoc. Director of Regional Economy	Bureau of Economic Analysis	(202) 523-0751
Getter, Doug	Supervisor for Research Section	Iowa Dept of Economic Development	(515) 281-3036
Gillaspy, R. Thomas	State Demographer	Minnesota State Planning Agency	(612) 297-2434
Gona, Debra	(Integrated State Information System Project--ISIS)	Council of State Govts.	(606) 252-2291
Grymes, Charles A.	(current automated data project)	Bureau of Land Management	(202) 343-3306
Harrison, Randy	Planning Director	Colorado Office of State Planning & Budgeting	(303) 866-3386
Hartman, Joey	(Vancouver city worker info service project)	Vancouver City Gov't. Canada	(604) 879-4671
Hayes, Richard	Research Associate	NGA Center for Policy Research	(202) 624-5334
Holden, Wendy	Asst. Commissioner	WA State Employment Security Department	(206) 753-1451
Hughes, Connie O.	Key Contact Person New Jersey State Data Center	New Jersey Dept. of Labor	(609) 984-2593
Huxhold, William E.	GIS Project Director	City of Milwaukee Data Services	Ask Clapp?
Kennedy, Stephen	Commissioner	New Hampshire Dept. of Administrative Services	(603) 271-3201
Kimble, Steve	Key Contact Person Florida State Data Center	Office of Planning & Budget	(904) 487-2814

ppendix I

Name	Title	Organization	Phone Number
King, John	Public Policy and Research	U. Cal at Irvine	(714) 856-7405
Lefberg, Dr. Irv	Director	Washington State Labor Market & Economic Analysis Branch	(206) 438-4800
Lingerfelt, Harley	Director, Information & Research Division	Oklahoma Dept. of Commerce	(405) 843-9770
Marchand, Donald	Dean	Syracuse University	(315) 423-2911
McLaughlin, Jim	Key Contact Person New Hampshire State Data Center	New Hampshire Office of State Planning	(603) 271-2155
Melley, Mary Lou	Data Administrator (RECRA Data)	Office of Solid Waste and Emergency Response, EPA	(202) 475-6760
Nelson, Jim	OTA Advisory Committee	Kentucky Dept. for Libraries & Archives	(502) 875-7000
Raleigh, Lynne	DP Programmer 1	Office of Telecommunications & Information Systems New Jersey Dept. of the Treasury	(609) 633-2509
Rosen, Dr. Laurence	Key Contact Person Michigan State Data Center	Michigan Information Center, Dept. of Management & Budget	(517) 373-2697
Rowe, John	Information Specialist	Data User Services Division U.S. Dept. of Commerce Bureau of the Census	(301) 763-1580
Rutherford, G. Scott	Research Director	Washington State Transportation Center	(206) 753-7364 (206)
Schnure, Theron A.	Assistant Director Head of State Data Center	Connecticut Office of Policy & Management	(203) 566-3905
Segal, Mark	Office of Toxic Substances	U.S. EPA	(202) 382-3446
Seidel, Karen M.	Senior Research Associate	Bureau of Governmental Research & Service University of Oregon	(503) 686-5232
Stenberg, Carl W.	Executive Director	Council of State Governments	(606) 252-2291

Appendix I

Name	Title	Organization	Phone Number
Thomas, Carl R.	Chief	Research & Statistics Division, Pennsylvania Dept. of Labor & Industry	(717)787-3265
Turner, Isaah	Commissioner	WA State Employment Security Department	(206) 753-5114
Vorlander, Carl	Executive Director	National Association of State Information Systems	(606) 252-2291
Vroman, Wayne	Senior Research Associate	The Urban Institute	(202) 857-8573
Warnecke, Lisa	Geographic Information Coordinator	Colorado Dept. of Highways	(303) 757-9802
Whiting, John H.	(current automated data project)	Bureau of Land Management	(202) 653-8798
Wills, Joan L.	Director	NGA Center for Policy Research	(202) 624-5355
Woods, James	Occupational Information System Coordinator	National Occupational Information Coord Comm	(202) 653-5665
Zacek, Jane Shapiro	Director	New York Management Resources Project Rockefeller Institute of Government	(518) 472-130
Zeisset, Paul	Special Assistant	Bureau of the Census	(301) 763-1792

Appendix II: Indepth Interviews

II A: Phone Interview

Name	Title	Organization	Phone
Barber, Grayson	DP Analyst 2	Office of Telecommunication & Info Systems	609-771-1847 (NJ)
Barton, Gerald	Chief of NEDRES Program	National Environmental Data Referral Service (Natl. Oceanic and Atmospheric Administration: NOAA)	202-673-5404 (WDC)
Dearstyne, Bruce	Executive Director	Natl Assoc of Govt. Archives & Records Administrators	518-473-8037 (NY)
Diamond, Stan	Research Director	Intergovernmental Cooperation Commission	217-782-6924 (IL)
Fongemie, Ray	Commissioner	LABORNET Project, Maine Division of Economic Analysis	207-289-2271 (MA)
Gona, Debra	Deputy for Policy Analysis	Integrated State Information System (ISIS) Council of State Governments	606-252-2291 (KY)
Hayes, Richard	Research Associate	NGA Center for Policy Research	202-624-5334 (WDC)
Holden, Wendy	Assistant Commissioner	WA State Employment Security Dept.	206-753-1451 (WA)
Huxhold, William	GIS Project Director	City of Milwaukee Data Services	414-278-5511 (WN)
Lingerfelt, Harley	Director	Info & Research Div, Oklahoma Dept of Commerce	405-843-9770 (OK)

II A: Phone Interview

Name	Title	Organization	Phone
McLaughlin, Jim	Key Contact Person	NH State Data Center, NH Office of State Planning	603-271-2155 (NH)
Melley, Mary Lou	Data Administrator	Info Mngmt Staff, EPA	202-475-6760 (WDC)
Payton, David	Director of Government Relations	Information Industry Assoc.	202-639-8262 (WDC)
Rowe, John	Information Specialist	Data User Services Division, Dept. of Commerce, US Census Bureau	301-763-1580 (MD)
Trudell, Libby	Mkt. Analyst???	DIALOG	415-858-3773 (CA)
Woods, James	Coordinator for Occupational Information Systems Development	Natl. Occupational Info Coord Comm (NOICC)	202-653-5665 (WDC)

II B: Personal Interview

Name	Title	Organization
Nancy Abraham	Assistant Commissioner	Minnesota Deptartment of Administration
Dave Anderson	Administrator	Food Stamp Section Division of Income Assistance
John Anderson	Strategic Policy Analyst	State of Minnesota Department of Human Services (Finance & Management)
Mary Attstadt	Supervisor A/R Accounting Office Sr.	State of Minnesota Department of Human Services
Barbara Baker	Section Head	Washington State Department of Social and Health Services Immunization Section
Michael Batutis	Chief Demographer	New York State Data Center Department of Commerce
Jim Bergan	OSHA Survey Analyst	Minnesota Department of Labor & Industry
Wally Bergerson	Sr. Research Analyst, Assistance Programs Division	State of Minnesota Department of Human Services
Jon A. Bloom, P.E.	Director	Highway & Area Planning Minnesota Department of Transportation
Marilyn Cathcart	Director	Legislative Reference Library
Sharon Dawes	Director	NY State Forum for Infor. Resources Management
Mike Donnelly	Senior Public Health Advisor	Washington State Department of Social and Health Services Office of Disease Prevention & Control
Tom Duffy	Senior Planner	New Hampshire State Data Center
Karen Engval	SSPS Information Supervisor	Washington State Department of Social and Health Services SSPS
Jeff Farmer	Computer Information Consultant	Washington State Department of Social and Health Services Division of Developmental Disabilities

II B: Personal Interview

Name	Title	Organization
Fred P. Fiedler, Ph.D.	Manager	Washington State Department of Social and Health Services Data Collection & Reporting Aging and Adult Services
Thomas Gillaspy, Ph.D.	State Demographer	Minnesota State Planning Agency
Margaret Hedstrom	Acting Head	Records Analysis and Disposition Section/State Archives The State Education Department
Rolf Hokansson	Program Administrator	Washington State Department of Social and Health Services Office of Financial Recovery
Stephen M. Kennedy	Commissioner	State of New Hampshire Department of Adminstrative Services
Irving Lefberg	Director	Washington State Employment Security Department Labor Market and Economic Analysis
Harold L. Madison	Research Analyst IV	Washington State Department of Social and Health Services Office of Research and Data Analysis
Paul H. Newman	Manager Software Technology	Washington State Department of Social and Health Services Office of Information Services
Renia Neuhauser	Research Investigator III Manager, Information System Securities	Washington State Department of Social and Health Services Bureau of Parent-Child Health Services
Warren H. Nyhus	Administrative Assistant, Health Care Programs	State of Minnesota Department of Human Services
Phillip A Ohman	Accounting Director	State of Minnesota Department of Human Services
Ken Pekarek	Planner Analyst	Minnesota State Planning Agency Geographic Data & Analysis Planning Information Center
Lois M. Pollari	Director	Minnesota Department of Administration Information Management Bureau Data Records Management Division

I B: Personal Interview

Name	Title	Organization
Charles Pollock	Fiscal Program Manager	Washington State Department of Social and Health Services Bureau of Refugee Assistance
Jim Ramstrom	DATANET project Manager	Minnesota State Planning Agency Planning Information Center
Alan Robinette	Director	Minnesota State Planning Agency Planning Information Center
Dave Rupel	Research Analyst	Washington State Department of Social and Health Services
Roger I. Sell	Executive Director	Minnesota Department of Administration Intergovernmental Information Systems Advisory Council
Larry G. Walker	Computer Information Consultant	Washington State Department of Social and Health Services Office of Support Enforcement
Mary Lou Wehling	Director, Services Management	Minnesota Department of Administration Information Management Bureau
Linda Rae Wynne	Computer Information Consultant	Washington State Department of Social and Health Services Long Range Systems Planning

Appendix III: Interview Questions

III A: Initial Telephone Interview

Name:
Title:
Phone Number:
Organization:
Type of Organization (pvt., state, federal):
Location (state):
Interview date:
Rating (1-5, 1 = excellent follow up):

1. Quick overview of your organization's activities?

2. What kind of backing or encouragement has this innovation/program received?

3. What are some of the policy issues that have arisen because of this technology?

4. Who else should we talk to who have implemented examples of interesting technologies? Why should we talk to them?

III B: In-depth Interview Questions

Interview Questions about Governmental Information Systems

Name: ______________________________

Title: ______________________________

Date: ______________________________

Organization: ______________________________

A. Uses

1. For what purposes do you use online information? (e.g., data preservation and historical analysis? increase operational efficiency, accuracy, and speed? replace printing for the dissemination of information? aid in policy planning and decision making? others?)

2. Why do you access data and information? To read? Manipulate? Change? Integrate with other info and data?

B. Compatibility, Quality and Applicability

1. Is incompatibility of hardware or software a major frustration for you?

2. Do federal regulations impact on state purchasing considerations?

3. Does your agency or group use data transferred from other agencies or groups? If so, is the format in which that data is presented generally appropriate to your needs? Are the units and definitions of terms the same? Do you have to redefine and reformat the data to meet your own needs?

4. When you access or provide online data and information, are you confident of its quality? aware of its source? familiar with the methods by which it was generated?

5. Do you analyze online data to determine its appropriateness for your particular situation and needs? Do information systems tell you enough about the data to make judgments about quality and applicability? Does your agency or group have enough expertise to determine whether online data and info are compatible with your needs?

6. Do you have more confidence in data and information presented in standard government printed form than that provided online? What, if anything, could be done to make online dissemination of information more reliable? more usable?

C. Accessibility and Security

1. Is it hard to discover what online info is available? Have you ever known that desired data and info existed, but were unable to access it? If so, why?
2. How helpful are the information systems you use? Do they make it easy to locate and access info? What more could they do?
3. How secure is the information you access? Is security a problem?

D. Timeliness

1. Is online information more timely for you than printed matter?
2. How crucial is your need for up-to-the-minute data and information? Do you need online data to be more timely? Updated more often?

E. Responsibility

1. Who should be responsible for the appropriate use of online data?
2. If you utilized online data which subsequently turned out to be inaccurate, would you generally know who to hold responsible?

F. Ownership and Cost

1. Who should own the information in information systems? Who owns the information acquired and disseminated by your organization?
2. If private industry adds value to data by making it easier to access, more reliable, more understandable, or easier to use, what should they get in return?
3. How should the cost of information be determined? Who should pay it?
4. Would you prefer to receive online federal information from private or federal sources?

G. Support

1. Where does the political support for your information technology and projects come from? Is it sufficient?
2. How much of a problem is maintenance? equipment purchasing? personnel? training? keeping up with new technology?

III B: In-depth Interview Questions

H. Coordination

1. How well coordinated are information efforts in your state? How is data sharing coordinated? Is there significant duplication and redundancy across state agencies?
2. Are privacy issues ever a hindrance to information sharing?
3. Do you subscribe to interstate information services? Which ones? How helpful are they?
4. How do you coordinate efforts with other states? with the federal govt.?
5. Are you generally aware of federal initiatives in the area of information technology (e.g. Census Bureau plans to sell machine readable products and online data access)? Are federal initiatives such as this adequately coordinated with the states?
6. How important to you are federal agency decisions about the nature of data retrieval systems, types of equipment, software, formats, user costs, etc.?

I. Political Issues

1. Has the new information technology affected the practice of politics in your state?
2. What is the legal status of online information in your state?
3. Has online info replaced printed info in your state?
4. Should the federal govt. relax rules requiring GPO printing to encourage online accessibility of federal documents?

J. Social Issues

1. Does the new information technology impact on your citizens right to privacy? What mechanisms exist to enable citizens to protect these rights?
2. Does your state have a freedom of information or disclosure act?

K. Projects

1. What information projects of particular interest are occurring in your state? Describe them.

Appendix V

Selected Literature

Betts, Mitchell. "Governor downloads state data." ComputerWorld. June 22, 1987. Vol. 21, no. 25.
A brief review of Governor Sununu's hands-on approach to financial management through the New Hampshire Integrated Financial System.

Chartrand, Robert Lee. "Information Policy and Technology Issues: Public Laws of the 95th through 99th Congresses." Congressional Research Service. Library of Congress. February 1987.
Summarizes congressional acts under the following categories: (1) Telecommunications, Broadcasting, and Satellite Transmission; (2) International Communications and Information Policy; (3) Library and Archives Policies; (4) Information Disclosure, Confidentiality, and the Right of Privacy; (5) Computer Security, Regulation, and Crime; (6) Intellectual Property; (7) Information Technology for Education, Innovation, and Competitiveness; (8) Federal Information Systems, Clearinghouses, and Dissemination; (9) Government Information Systems, Clearinghouses, and Dissemination.

Cook, Lauren. "The State Scanning Network: An Issue Identification System for State Policy Managers." Futures Research Quarterly. Spring 1986. pp. 65-77.
Describes the Council of State Policy & Planning Agencies' efforts to create "a powerful method to help the nation's state policymakers identify emerging problems and opportunities, locate additional information and qualified experts, and learn from the early actions of others faced with the same challenges."

Freedman, Henry B. OTA. "Selected Technology and and Policy Issues of Electronic Printing and Publishing." February 1987.
The Federal Government is the single largest user of electronic printing technology. Yet, this paper reports, little effort is made by the government to control the waste involved, to determine the government-wide cost of electronic printing, to investigate new technologies, or to renovate and re-educate its agencies. The paper gives an overview of current federal printing and publishing technology, a summary of current and near-future printing, publishing, and related technologies, and an analysis of some possible scenarios for future dissemination of government information (which essentially involve direct electronic transfer of information coupled with on-site printing at libraries, United States Post Offices, or at the actual site of the recipient). The paper concludes that current and near-future printing and publishing technology, properly organized and implemented, could improve speed and quality while saving the federal government hundreds of millions of dollars annually.

General Accounting Office. "Survey of Federal Agency Information Needs and Practices." April 1987.
A large (forty page) survey that was distributed, in conjuntion with the current OTA study, to the Information Resource Manager in a variety of federal agencies. The questions cover the ownership, cost, demand for, and amount of information disseminated to the public by federal agencies. The survey was developed to collect this information, to identify the ways electronic technology might benefit information dissemination, and to analyze "key federal information dissemination issues and options."

Grodsky, Jamie A. "Technology and the Government-Press Relationship" OTA. April 1987.
One of the press' functions is to act, in essence, as a private sector disseminator of public information. This document examines how new information technologies may affect this role. In

particular, electronic dissemination (essentially electronic mail or electronic press releases) is examined: it has the potential of producing cheaper, more timely and more geographically equitable information for use by the press. The status of electronic information dissemination at six federal entities (USDA, Supreme Court, EPA, White House, Bureau of Labour Statistics, and the Federal Elections Commision) is examined. This varies from the Supreme Court and EPA, which have no electronic dissemination system, and the White House, which discontinued its system because of protests over the cost for use and alleged favouritism, to the USDA, which has developed an extensive online news and information system. The document also reviews the technologies in use by the press, and the limitations therein. It ends with a review of the shortcomings of current government/press automated ddissemination, and a discussion of a variety of technologies which may serve to brige these shortcomings.

Haselkorn, Mark, and Lewton, Barbara. "A Map of the Communication Jungle: Improving the Processing, Production, and Dissemination of Technical Information by the Environmental Protection Section of the Department of Social and Health Services." March 1987.
Analyzes the unique communication environment of the Environmental Protection Section (EPS) and the obstacles to effective communication found therein. These obstacles include unusually diverse communication goals and auidences, and organizational barriers (including complex lines of communication and unclear decision procedures). The report makes a large set of reccomendations, including (but not limited to) improving EPS' information dissemination technology; improving the training of EPS staff, in both the use of the new technolgy and in general communication principles; and improving EPS' communication practices and procedures.

Holden, Constance. "Census a Public Burden?" News & Comment. August 21, 1987.
Briefly overviews recent problems with OMB coordination of federal statisitical efforts.

Information Industry Association. "Policy Statement of the Information Industry Association." 1985.
Summarizes the philosophy and position of the information idustry on the appropriate roles of the private and public sectors in the provision of information products and services. This position is essentially that the government should take a minial role in regulating the information industry and should avoid any involvement in the information marketplace which constitutes competition with private information services.

Intergovernmental Information Systems Advisory Council, Minnesota Department of Administration. "Planning and Implementing Management Information Systems Within Minnesota Local Governments." July 1985.
Summarizes the work of the Intergovernmental Information Systems Advisory Council (IISAC), which included assisting the organiztion of several information management systems for local governments and organizing on-going educational and promotional events on information technology for local governments and individuals. This report also discuses areas the IISAC is currently adressing, which include determining the information needs of local governments and identifying ways to meet these needs.

Joseph, Earl C. "Electronic Information Technology Identification, Forecast & Assessment." December 1986.
Summarizes a wide range of electronic information technologies, and notes that the rapid advances in the capability of these technologies are quickly turning the United States into an "Information Age" nation. The axiom that "Information is Power" implies a necessary re-thinking of what constitutes poverty, privacy, economy, and political responsibility in the information age; several areas that need the development of new federal policy are noted.

King, John Leslie & Kraemer, Kenneth L. Public Policy Research Organization. "Information Resource Management in the Federal Government: An Assessment of the Concept and Its Promise."

Information Resources Management (IRM) was proposed by the Commission on Federal Paperwork (1977) and incorporated in the Paperwork Reduction Act of 1980 as an organizing concept for dealing with the problems of information systems in the U.S. Federal Government. IRM was founded on three assumptions: that organizations (in particular, government organizations and agencies) are systems which can be controlled using systems theory; that information is a resource in the economic sense, and can be treated and managed like any other resource (such as land or labor); and that adopting particular management techniques incorporated in IRM can lead to more efficent and effective information management in federal agencies. This paper questions all three of these assumptions: it shows that systems theory is an inadequate tool for managing governmental organizations; that information is not a resource in the economic sense, and the techniques for dealing with it in this sense are lacking; and that ambiguities in the role of IRM in the government, as well as practical constraints on the imposition of top-down reforms, make it less than adequate as a management system. The paper ends with an interesting example: a cooperative project involving eleven federal agencies and six cities, known as the Urban Information Systems Inter-Agency Committee (USAC), operated between 1968 and 1975 with the goal of creating six prototype "integrated municipal information systems." Although the experiment failed due to a variety of reasons, including technical difficulties and political problems, it encouraged thinking among many local government information planners which led to local improvements in information systems planning. The paper thus argues that the IRM concept, although doomed to failure, may have some beneficial fall-out.

Land Management Information Center, Minnesota State Planning Agency. "LIMC Data and System's Inventory." July 1986.

Compendeum of data bases available through the LIMC system, including DATANET.

Minnesota Information Policy Council. "Minnesota Information Management Principles." November 1986.

Statement of management, data, standards, and people principles for state government information systems.

Minnesota Journal of the Senate, Monday, May 18, 1987, Subdivision I.

Establishment of an office of information systems management. Responsibilities, advisory task force, and funding.

Minnesota State Planning Agency. "Datanet" (brochure & literature) 1987.

Datanet is a collection of 13 online databases of statewide statistics containing over three million pieces of information that is maintained by the Minnesota State Planning Agency. The databases contain a variety of data (such as information on agriculture, state grants and loans, housing, employment, and economic indicators) culled from state and federal sources; much of it is broken down out by county or city. The service is relatively cheap and easy to use, and serves over 60 subscribers, including libraries, social-service agencies, newspapers, and private companies.

Minnesota State Planning Agency, Land Management Information Center (information literature).

The Land Management Information Center (LMIC) is a central data clearing-house and information service bureau operated by the Minnesota State Planning Agency, which offers database development, data analysis, and data output services on a per-fee basis. The focus of the LMIC is a collection of spatial and land-related databases (such as geographic and political boudries, land ownership and use distribution, and soil data) for the state of Minnesota.

New York Forum for Information Resource Management. "Proposal to Support a New York Forum for Information Resource Management." 1986.

Proposed a central informational and educational resource for New York State public executives and their agencies. That resource, the New York Forum for Information Resource Management

(NYFIRM), is now a reality. It exists within the Nelson A. Rockefeller Institute of Government and provides a variety of services, including: conceptual seminars on information tehnology and related public policy issues; a resource directory; a variety of forum groups for the exchange of information in particular areas of concern (such as common software applications and telecommunications); and liason with private sector and academic organizations which have "expertise relevant to the use and management of information resources."

New York Governor's Office of Management and Productivity. "Computer and Audio-Visual Records in State Government." April 1986.
Surveys and assesses the scope and value of computer and audio-visual ("special media") records systems used by the New York State government. This report concludes that information stored on "special media" is dangerously fragile, and can be expensive or impossible to replace. Extrordinary measures must be taken to identify the records at risk, to acquire the resources to preserve these records, and to take the steps necessary to provide long-term storage for them.

Nezzo, Carol S. OTA. "National Center for Health Statistics: The Changing Nature of Federal Information Dissemination." March 1987.
The National Center for Health Statistics (NCHS) collects, analyzes, and disseminates data concerning health research and medical care programs within the U.S. This data is mainly for use by the federal government, but it is also used by other organizations, businesses, an the general public. This document describes the automated survey proceedures, publishing system, and information distribution methods used by the NCHS. The electronic publishing system now used by the NCHS (a sophisticated XyVision system) is detailed. One of the presented advantages of this system is that it makes information more accessible to hanicapped employees and users. The NCHS gets much of its data from the states in electronic form (though a few still use microfiche), and distributes it several ways: on paper (through the GPO), on tape, and through a free electronic BBS. It is considering CD-ROM and on-line databases.

OTA. "Electronic Record Systems and Individual Privacy." June 1986.
Analyzes the current use of information technology by Federal Government and concludes that the Privacy Act of 1974 is deficient in several regards, leaving numerous "grey" areas which can be and are being exploited by Federal agencies armed with modern information technology. In addition, what existing safeguards on information which have not been overwhelmed by the pace of technology are often overlooked in practice. The report recommends that congessional action be taken to provide policy and regulation in this area.

OTA. "An Overview of the Library Community and Federal Information Dissemination: Technologies, Access Issues, and the Depository Library Program." March 1987.
Analyzes the current operation of the Depository Library Program, and details a variety of technologies (on-line databases, library communication networks, optical discs, and facsimile) which will have an impact on the program. It then addresses some issues that are raised by these technologies -- including the problem that the Depository Library Program only accepts information in paper or microfiche form, while more and more federal agencies are putting their information into primarily electronic forms.

OTA. "Information Technology R&D: Critical Trends and Issues." February 1985.
Considers a wide range of issues bearing on research and development (R&D) in information technology in the United States. These issues include the roles of industry, universities, and government (including deregulation and divestiture) in information technology R&D. In particular, four areas of information technology are studied in detail: advanced computer architecture, software engineering, fiber optics, and artificial intelligence. In addition, the R&D efforts of other industrialized countries are analyzed, with particular emphasis on Japan, France, and the United Kingdom. The report reachs several conclusions: although information technology is an area in which the United States has shown great strength, this has been eroded

recently by competition from foreign nations, and there is concern that an unbalanced flow of technical information from the United States is exacerbating the situation; civilian R&D may be suffering at the expense of federal funding for purely defense-related research; industry is generally involved in short-term, applied research and expects the academic community to perform and the federal government to support long-term basic research – while at the same time universities are increasingly becoming involved with industry in new relationships aimed at transfering academic research into commercial applications; and government information R&D policies must take these issues into account.

OTIS Newsletter, New Jersey Office of Telecommunications and Information Systems, Vol 2, Issues 1,2, 3

Robinson, William C. and Stone, Athena A. "The Impact of the Reduction in Federal Government Statistical Publications and Services on State Government Statistical Agencies." Government Publications Review, Vol. 14, 1987, pp. 433-448.

Concludes that, contrary to General Accounting Office claims, recent reductions in the budgets of statistical agencies have adversely affected almost all state statistical agencies.

Second Substitute Senate Bill No. 5555, State of Washington, April 25, 1987.

Establishment of a department of information services. Definitions, authority, constitution, advisory board.

Wood, Fred B. OTA. "Key Technological Trends Relevant to Federal Information Dissemination." May, 1987.

A very up-to-date and complete survey of information technologies as they relate to the federal government. The techologies reviewed include: microcomputers, desktop publishing (both low- and high-end systems), electronic forms management, computer graphics, scanners and printers, electronic on-line information retrieval, telecommunications, electronic mail, optical disks, and technical standards relating to these technologies